THE IRON AGE

New York, March 18, 1926

ESTABLISHED 1855

VOL. 117, No. 11

Standard Practice for Molding

Advantages of Following Definite Schedule—Molding Costs Cut in Half—Details of One Example

BY PAUL R. RAMP*

THERE is a right way and there is a wrong way to do everything. This is just as true in a foundry as it is in any other place. For this reason it is important that, whenever possible, a standard practice for molding a certain piece or class of work should be adopted, after it has been demonstrated that the best method has been discovered.

Annually there are thousands of dollars spent in foundries for molding equipment such as flasks, patterns, etc., in an effort to produce better castings at a more reasonable cost. In a jobbing foundry, or in a foundry making heavy castings, the question of improved methods of molding, requiring improved molding equipment, is sidestepped more times than it is considered. This is a mistake. While it is true that flasks cost money, yet, if they are built with a thorough understanding of how the work comes into the shop, they will soon pay for themselves by reducing molding costs, and will improve the quality and increase the daily capacity of the foundry.

It does not require an expert to figure the difference between molding a large casting in a flask and molding it in the ground, or making the mold in loam. But the building and designing of flask equipment and the establishing of a standard molding practice must be given a great deal of thought and study. If this is not done by those who are qualified, a great amount of money can be spent without adequate return.

Another important thing in connection with establishing a standard practice is to make every detail connected with the standard very plain to the foreman and to the workman who are going to do the work, and not to allow them to neglect even the smallest detail which has been prescribed.

Making Haste Slowly

The best plan for getting a foundry working after modern methods is to take one class of work at a time, design and build the best flask equipment possible, and furnish the foreman detailed instructions of how the piece is to be molded. These instructions must be so complete that if they are followed a bad casting cannot be produced. Some will say that this plan requires too much of the executive's time, but this is not true. It must be borne in mind that, if the men are taught every detail connected with the molding of one large piece, they are better mechanics and they are better qualified to produce similar pieces without detailed instructions.

In a shop producing large castings of various designs, it may not be possible to establish more than half a dozen standard molding practices a year. But these six standard methods on six different kinds of work will do wonders toward educating the men along modern lines. They will unconsciously apply the same methods to other work which has not been standardized; so it can readily be seen that the standard practice method is of as much value in a foundry of this character as in a foundry doing repetitive work.

Following is a standard method adopted for producing the stern tube in a ship. This casting is cylindrical, and it must be perfect in every respect, and free from all defects. It has been the common practice to produce these castings by imbedding them in the floor. It was found that this method was expensive, and not so reliable when the great question of quality was of so much importance.

To establish as perfect a practice as possible, it will seem that some of these instructions are of a kindergarten nature, as will be noticed in the following example. But we must remember that, if we are to produce a perfect casting, we cannot leave anything to the workman's imagination.

Standard Practice for Molding Stern Tubes

1.—Level the floor with molding sand to receive the wooden bottom board.

2.—Lay the bottom board on the level bed of sand. We use two boards instead of one, because one would be too hard to handle.

3.—Place the drag half of the stern tube pattern on the wooden bottom board, with joint side of pattern down.

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MANY articles derive a major share of their permanent value from the suggestions back of their text. Not always is the exact method described by an author applicable, without some modification, to the next man's problem. Of this suggestive type is the story here given of the molding practice developed for one special type of casting. Meticulous detail, to fit the single purpose described, will be translated by the reader as he mentally adjusts it to his own conditions. In this manner the method presented will achieve its full measure of helpfulness.

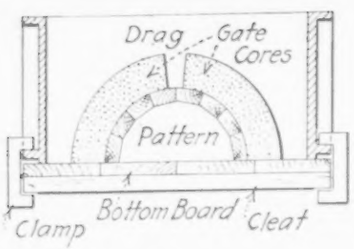


Fig. 1

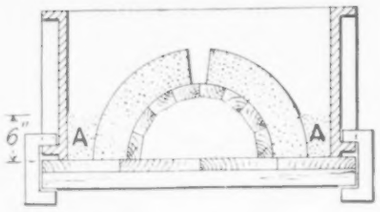


Fig. 2

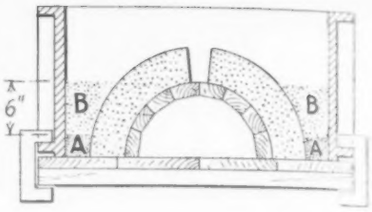


Fig. 3

4.—Place the drag part of the stern tube flask on the wooden bottom board, with the joint down next to the board. See that the outer edge of the flask matches up with the outer edge of the board, so that it will be possible to clamp the board to the flask securely.

5.—Clamp the board to the flask with twelve steel clamps, six on each side of the flask. In clamping the boards to the flask, drive the first six clamps on one side gently, then drive the second six on the other side on hard, and come back to the first six and drive them on hard. This will prevent drawing the bottom board out of shape.

6.—Locate the drag half of the stern tube pattern in a proper position in the flask, allowing for space to ram up the vent seals on both ends and for placing the gate.

7.—Place the gate cores in position. At this time inspect the gate cores to determine whether they are perfect cores and whether or not they have been blacked inside. The gate cores must not be dried more than enough to hold them together, as they will receive a second drying when the mold is placed in the oven. See that the gate cores fit snugly against the pattern and at the same time rest on the bottom boards.

Now, with the gate cores in position, we have our flask ready to receive the sand. Fig. 1 is a cross-section of the bottom board, flask, pattern and gate cores in position. It also shows the clamps holding the bottom board to the flask.

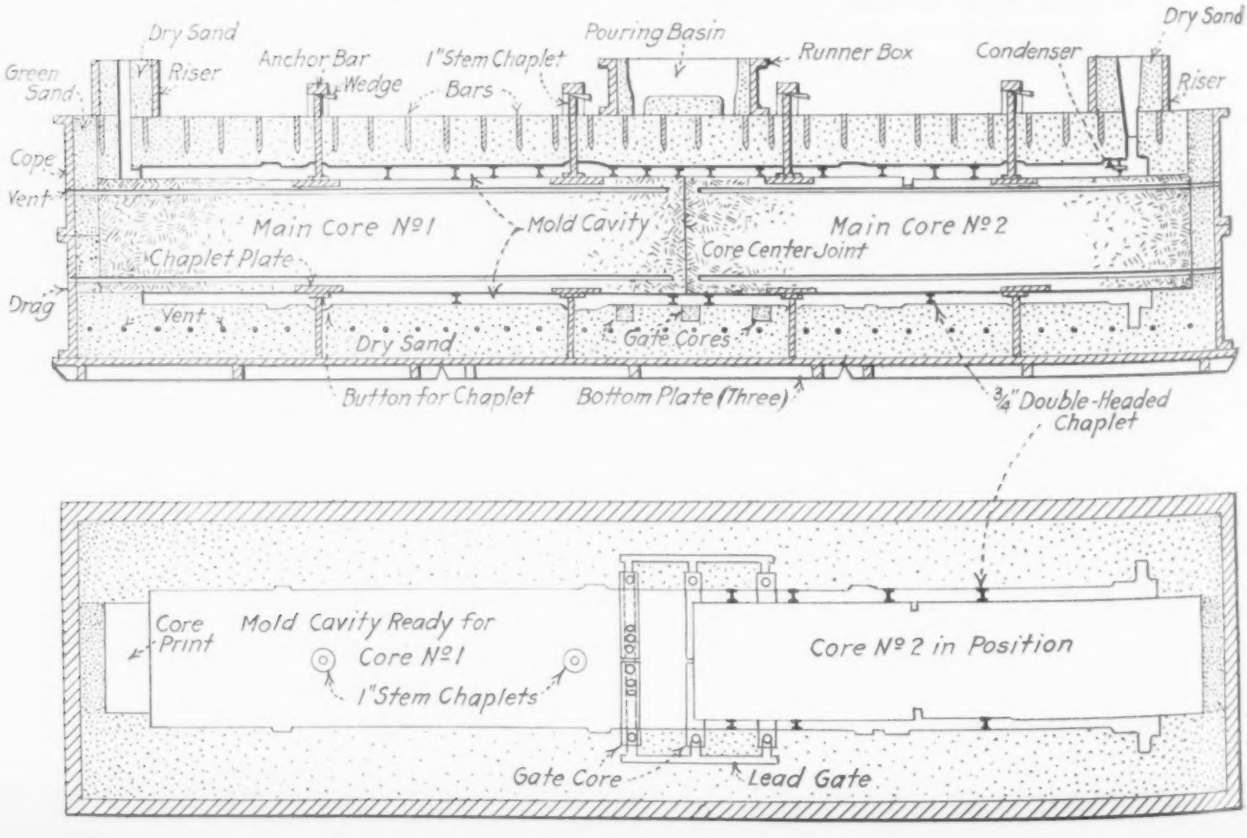
8.—Instruct the helper to fill in around the pattern to a depth of 6 in. with facing sand. In this connection, he must start at one end of the flask and fill in on both sides of the pattern, and as soon as he has filled in, in this manner a space 2 ft. long, the molder must start ramming. Both sides of the pattern must be rammed at one time, to avoid crowding the pattern over to one side. If two men are ramming, they must work opposite each other. Ramming around the gate cores must be done with a small hand rammer, to produce a solid mold around these cores without breaking them. The helper must at all times be instructed to keep ahead of the molder and not allow him to wait for sand to ram. Fig. 2 is a cross-section of the drag, with the first 6 in. of facing sand filled in ready for ramming. The facing used for this mold must consist of 13 parts of screened gravel to one part of core compound or flour.

9.—When the helper has filled in the first ramming the entire length of the flask, it is reasonable to expect that the men ramming are close behind him. He must start at the other end of the flask and fill in again to the depth of 6 in. Fig. 3 shows the first filling, marked "AA," rammed, and the second filling, marked "BB," filled in ready for ramming. In ramming the second filling, the hand rammer must be used to ram around the gate cores, to avoid breaking them.

10.—When the molders ramming the second filling have progressed far enough, the helpers must proceed with the third filling. The third filling must be 8 in. deep. When ramming the third filling, the work around the gate cores must be done with the hand rammer, to avoid breaking them. Fig. 4 is a cross-section of the mold showing the first ramming "AA," and the second ramming "BB," and the third filling "CC."

11.—The third filling, which is 8 in. deep, must be rammed in the same manner as the first and second. At this time, before the helper fills in for the fourth ramming, the top of the third ramming must be leveled off, and the position vent rod placed in position. This work consists of pushing ⅝-in. round rods through the holes in the sides of the flask until they extend over the center of the pattern. After the positive vent rods are in position, the surface directly over the pattern must be covered with a bed of cinders not less than 4 in. deep. This is done to make a good connection with the positive vents that will be formed by the vent rods laid in ahead of the cinders. A positive vent is a vent passage free from any obstruction.

12.—After the positive vent rods have been properly located and the cinder bed put in, the helpers must be instructed to fill the flask with heap sand. This will be the fourth and last filling for the drag and the sand must be heaped up above the flask far enough to enable the molders,



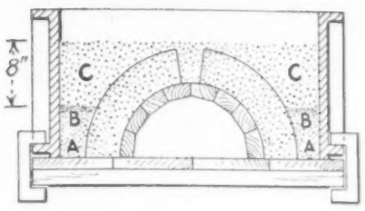


Fig. 4

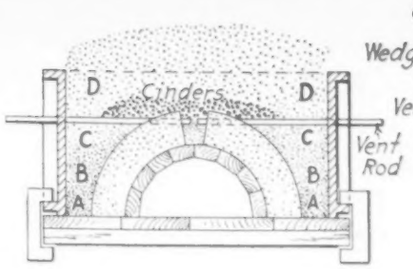


Fig. 5

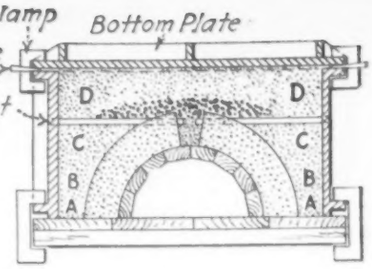


Fig. 6

in ramming, to produce a solid surface at the extreme limits of the flask.

Fig. 5 is a cross-section of the mold in progress, fillings A, B, and C, rammed. Positive vent rods are in place; also cinder bed, and filling number four, marked "DD," is ready for the final ramming of the drag. Do not ram with the air rammer directly over the gate cores.

13.—When the fourth ramming is made on the drag part of the mold, the excess sand must be scraped off flush with the edge of the flask, and a bed of loose sand distributed over the surface, 1 in. deep. This bed of loose sand is to receive the bottom plate and to insure a perfect bearing between sand and plate.

14.—Place the bottom plates on the flask in their proper positions, and settle them down solidly by striking them with a heavy sledge. Care must be used to see that the plates do not rock, as there must be no space between the bottom plates and the sand. Such a condition will rob the mold of its necessary support, and it will produce a casting with an ugly swell.

15.—When the bottom plates have been settled in position, they must be clamped to the flange of the flask. In driving these clamps on, the same care must be used as is specified in clamping the bottom boards to the flask.

16.—After the bottom plates have been securely clamped, a metal wedge or large spike must be driven between the bottom edge of the flask and the bottom plate at each point where a clamp is located. This is to insure a metal-to-metal bearing and to prevent the clamp's coming loose. Fig. 6 is a cross-section of this drag-mold. It is rammed, clamped and ready to roll over. The positive vent rods have been drawn out of the mold, leaving a clear vent passage. The clamps which hold the bottom plate are shown with the metal wedge beside them, which is driven between the bottom plate and the flask. The cinder bed is also in evidence, and rammings A, B, C and D. This completes the work of ramming the drag part of this mold. The next operation is to roll the mold over.

17.—After the drag is rolled over, remove the clamps which hold the bottom board to the flask and place them in a neat pile. Remove the wooden bottom board. Vent

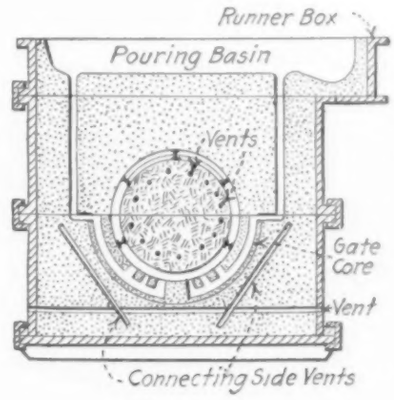


Fig. 8 (on Page 754) and Fig. 9 Are Longitudinal and Transverse Vertical Sections Through the Completed Mold, With Cores in Position. These sections show in detail the number, extent and location of the various vents used

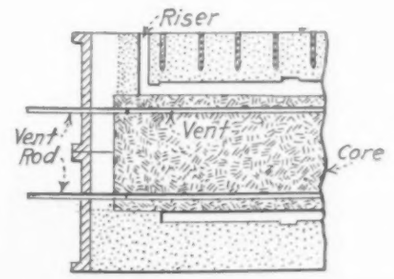


Fig. 10 (at Bottom on Page 754) Is a Horizontal Longitudinal Section. At the left end are shown the mold cavity and location of stem chaplets and gate core. At the right end the core is in place, held by chaplets as shown. Fig. 11 illustrates the end venting

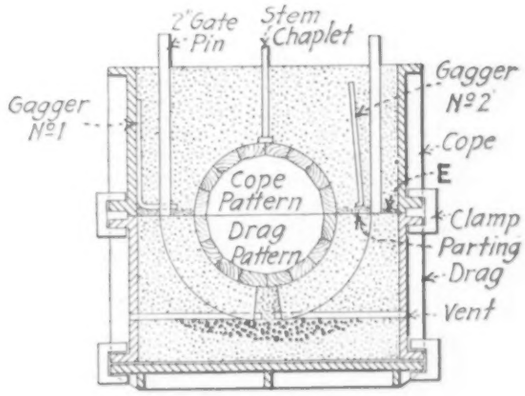


Fig. 7

with ¼-in. vent rod, down beside the pattern from the joint to the cinder bed. These vents are to be 4 in. apart.

18.—Close up the side vents leading to cinder bed, by ramming them with a hammer handle. Strike off joint and make parting. In making this parting, wherever possible, make the parting line straight from the joint of the pattern to the joint of the flask. This is very important, and contrary to the practice of a great many old-time molders; but there is less danger of a crush, should the flask shift a little.

19.—After the parting is made, place the cope half of the pattern on the drag half, which is rammed up. At this time be sure that there is no shift in the pattern and that the two halves match up perfectly. If there is a shift, and not time to have new dowel pins put into the pattern, locate it properly and nail it together.

20.—With the cope half of the pattern in position, the parting made, and the joint openings in the gate cores filled with a ball of waste, the next operation is placing the cope flask.

21.—With the cope flask in position, place four down-gate pins, 1½ in. in diameter, as close to the gate cores as possible, two on each side of the pattern.

22.—With the gates in position, the next thing to do is to cover the entire surface of the parting with facing. This facing is to be riddled through a No. 4 riddle, and to be not more than 1 in. deep.

23.—The next operation is to place the gaggers. Fig. 7, is a cross-section of the entire mold cope and drag rammed, showing the down-gate pins in position, the 1-in. depth of facing and the gaggers placed. In placing these gaggers they must be staggered, the toe No. 1 gaggers extending toward the pattern, with the shank set snugly against the wall of the flask, and toe of the No. 2 gaggers in line with the sides of the flask, with the shank placed snugly against the bars. This plan to be continued until every space formed by two bars has four gaggers, two on each side of the pattern.

24.—After the gaggers are placed, the helpers must fill in with facing sand for the first ramming, this filling to be not over 6 in. deep, and, as in ramming the drag, the helpers must keep ahead of the molders. The first ramming must be done with care. While it must be rammed snug, care must be used not to ram too hard in one place nor hard enough to deform the joint.

25.—The second ramming should be made in the same manner, also the third, until the cope is rammed full.

26.—When the cope has been rammed full and struck off, a parting must be made around the riser heads and around the down-gate pins. After this parting is covered with parting sand, the special metal runner box must be placed in position and rammed full. After it has been rammed full, the runner basin must be cut out with the trowel and made up in the same manner as when making a

(Continued on page 816)

Machine Tools in Power Plants

Maintenance of Generating Equipment Essential to Insure Uninterrupted Service—How Problem Was Solved in New and Old Stations

BY ROGERS A. FISKE*

ABOUT 25 years ago two men, the one a prominent engineer and the other an officer of a utility company, came to the bold decision to order two 5000-kw. steam turbines for a central station which was being built at that time. Turbines were then a new departure in the field of power. Nevertheless, these men had faith in the ultimate ascendency of this type of equipment and were even so courageous as to prophesy that the time would come when as many as 15 5000-kw. turbines would be operating in one station.

The prediction has been more than realized. In the Crawford Avenue Station of the Commonwealth Edison Co., Chicago, one 60,000 and two 50,000-kw. turbo-generators are now in operation and a 75,000-kw. turbine is being installed. A fifth unit to generate more than 100,000 kw. is contemplated, and it is not at all improbable that the station, when it reaches its ultimate capacity, will develop not less than 1,000,000 kw.

This is indeed a rapid growth and still the end is not in sight, for the Commonwealth company is now planning its fifth central station, in order that it may keep abreast of the increasing demand for power.

*Western editor, THE IRON AGE.

Continuity of Service is Imperative

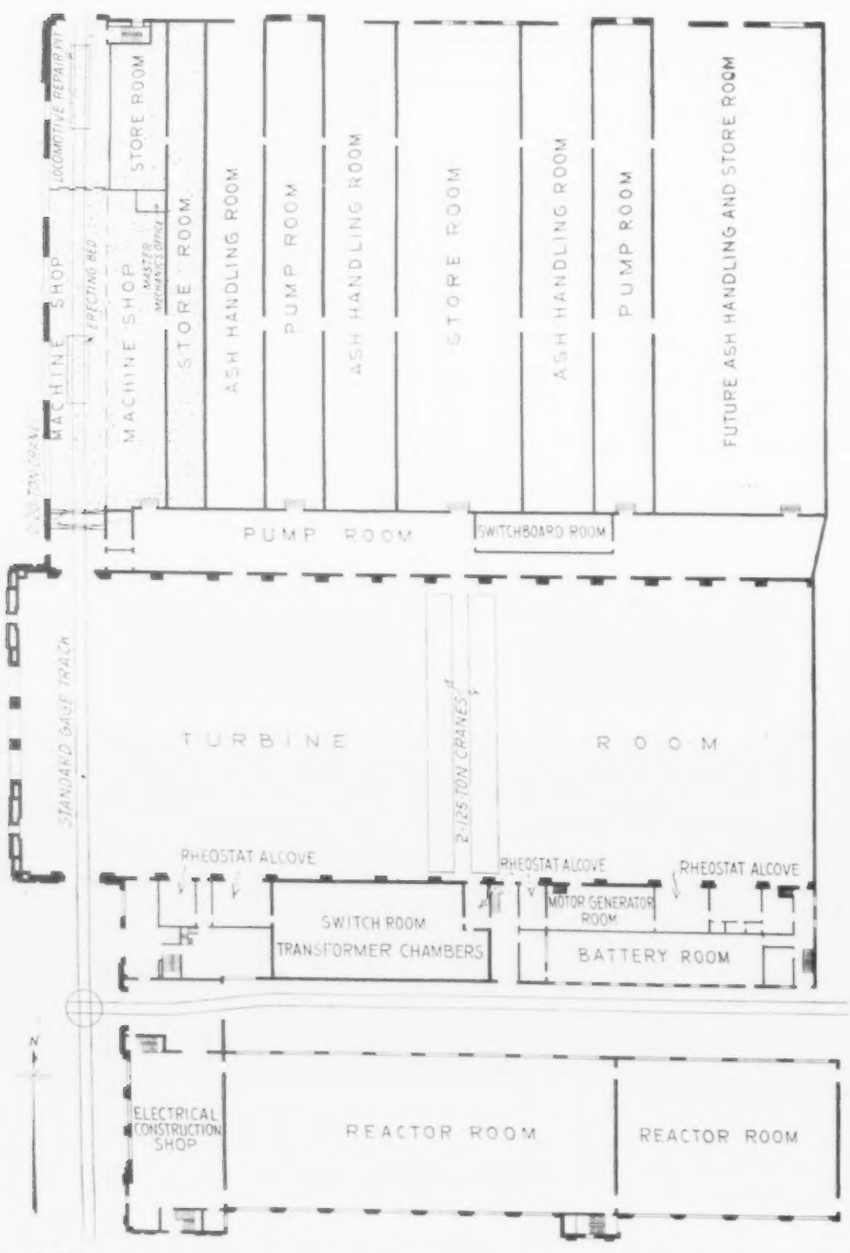
The mere installation of generating equipment, however, is not a guarantee of uninterrupted service. There must also be a fair degree of assurance that the equipment can be thrown on the line whenever it is needed. It would be a prohibitive expense to carry all equipment in duplicate, and further, it would not be satisfactory to depend either upon railroad transportation or outside shops for current maintenance.

Twenty-five years ago practically no attention was paid to power plant equipment outside of that which was used directly for the production of electrical energy. Today the situation has changed materially, and well located and equipped machine shops are being constructed as integral units of power plants.

Well Planned Machine Shop at Crawford Station

An example of this is the Crawford Avenue Station, which represents the latest in power plant planning, construction and design. The main turbine room extends east and west and is provided with two 125-ton cranes, with 10-ton auxiliary hooks, built by the Whiting Corporation, Harvey, Ill. At the west end of the room is a standard-gage track which runs north and south and extends into a machine shop bay, which is at right angles to the crane runway in the turbine room. Built into and forming an integral part of the main building, the machine shop is located so that the work to be done there is well coordinated with the operation of the plant.

The machine shop is divided into two sections, the one for the maintenance of heavy pieces of equipment and the other for lighter



At Crawford Avenue Station Heavy Parts Are Transferred from the Turbine Room to the Machine Shop on Standard Gage Cars

work. The former is traversed for its full length by the standard-gage track which extends through the turbine room, and overhead it will be served by electric cranes to be erected at an early date. Thus heavy parts are handled by the turbine room crane to cars which are then moved into the machine shop. The lighter machine tools are not under the machine shop crane runway, but are in an adjacent bay, which is readily accessible to a tool and light weight material store room. Storage space for replacement parts and heavy equipment is located on the fourth floor, and the transfer of materials to the machine shop is made through an open shaft, served at the top by a 10-ton electric hoist, supplied by the Euclid Crane & Hoist Co., Euclid, Ohio.

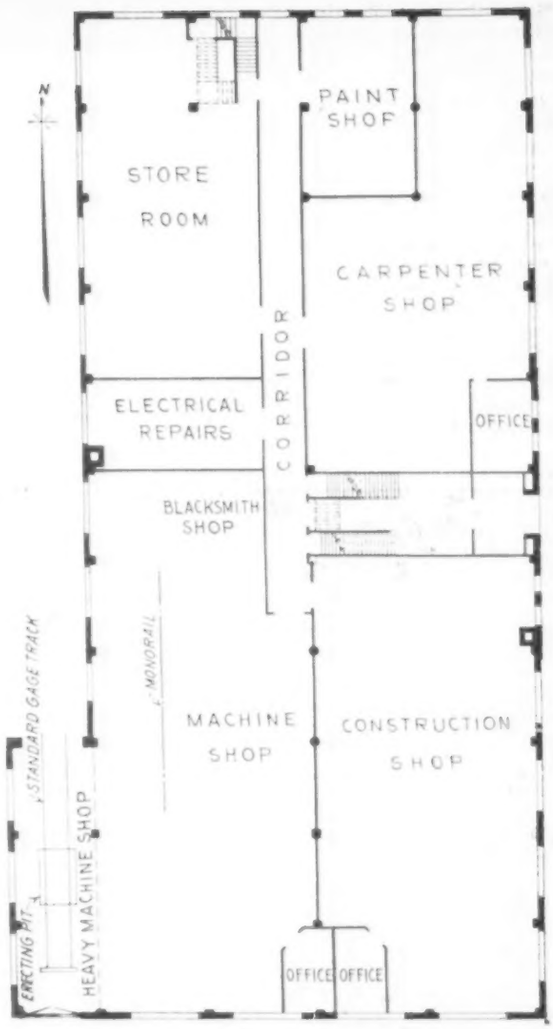
Equipment in the Crawford Avenue Machine Shop

Since this station is only one-quarter completed, the machine shop has not been fully equipped. The tools which are in use at present, however, are as follows: In the main machine shop bay is a 36-in. x 24-ft. engine lathe, built by the American Tool Works Co., Cincinnati, and a 24-ft. 6-in. vertical boring mill, constructed by the Niles-Bement-Pond Co., New York. In the adjacent bay are a 20-in. shaper, a 24-in. x 16-ft. engine lathe and a 12-in. x 10-ft. engine lathe, supplied by the American Tool Works Co.; a 12-in. Francis Reed Co. (Worcester, Mass.) sensitive drill, an H. G. Blount Co. (Everett, Mass.) 12-in. duplex grinder, a 20-in. Rockford Drilling Machine Co. drill, and a high-speed saw, built by the Peerless Machine Co., Racine, Wis. Additional equipment which will be put into service soon includes a No. 4 milling machine, an 8-in. pipe threading machine and a 1½-in. bolt cutter.

Erecting Bed Provided

Because of the great size of the generating units in the plant, it will be necessary in time to machine individual pieces which will weigh about 60 tons each. These would be cumbersome to handle in a stationary machine, and accordingly there has been provided a foundation for an erecting bed, which will be on the center line of the track and directly beneath the machine shop crane. This bed will be constructed of reinforced concrete and finished with a cast iron plate provided with Tee slots. To work on these large pieces a portable head stock, a portable tail stock and a portable tool head will be provided.

It is notable that the machinery in the power station is all of a very high grade. Apparently the management refused to consider shifting about old machine tools or buying used machinery, but rather determined to have and operate only such equipment as would do maintenance work of the very highest order. This attitude is not confined to one operating company, but is typical of the new order of things throughout the power producing field.



The Machine Shop, Stores and Maintenance Departments at Fisk Street Station Are Now Housed in a Separate Building

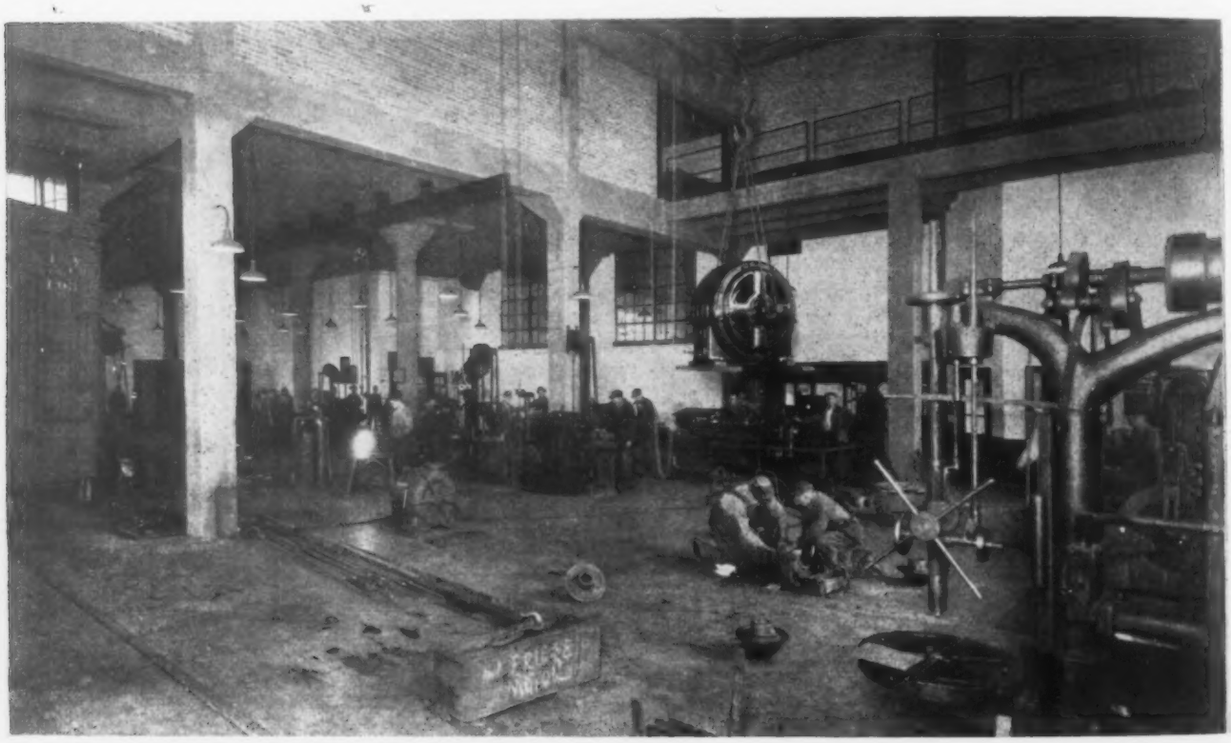
Machine Tool Needs in an Old Station

A graphic example of the emphasis now placed upon the installation of machine tools in central stations is

Light Machine Tools at Crawford Avenue Station Are Grouped Separately from the Heavy Tools

the maintenance department of the Fisk Street Station of the Commonwealth Edison Co., Chicago. This station was built in 1903, and although a machine shop was provided, it was located off in one corner of the building, a long distance from the store room and in a place unsuited for the purpose, as is evidenced by the fact that the space is now used for the storage of bricks.

In a power plant the size of a machine shop and the selection of tools for it should not be based upon the requirements of a new station. As generating equipment grows older it naturally requires more maintenance, putting a greater tax upon the machine shop. These facts, combined with the growth of the station at Fisk Street, crowded the old machine shop out of its space in the main building. In 1912 a separate building of stucco was built to house the machine shop. This afforded temporary relief. The machine shop, however, was now still further isolated from the storage department and the electrical shop. The distance from the latter was especially disadvantageous because a good portion of the maintenance work performed was on parts for motors and other electrical equipment.



One End of the Fisk Street Machine Shop Is Two Stories in Height and Is Served by a Crane to Transfer Parts to Storage Above or to the Basement

Box Cars Used for Storage

During this period of growth the storage problem was particularly perplexing. Raw material, spare parts and duplicate apparatus were stored in almost every part of the building and to suit the individual requirements of department heads rather than those of the organization as a whole. One experiment tried at this time was to purchase a number of second-hand box cars for the storage of heavy parts. These cars, being mobile, could be kept in the yard and switched in to be unloaded by the power house cranes when an emergency arose. This move tended only further to scatter the stores and also resulted in damage to electrical apparatus because of sweating brought about by sudden and extreme changes in temperature.

Permanent Maintenance and Store House Built

This situation prevailed until 1924, at which time it was decided to build a permanent maintenance and store house for all the various maintenance and supply departments of the station.

The new building is of reinforced concrete and brick, two stories in height with a basement. It is L-shaped, with a hallway running north and south through the stem of the L and with the toe pointing toward the west. The machine shop occupies the southwest corner of the first floor and the toe or west extension. This extension is two stories in height and is traversed east and west by an overhead electric crane. While the crane does not command the entire machine shop floor, it does cover a standard-gage railroad track, which extends north and south through the extension, and a platform at the height of the second floor on which materials can be placed and moved to a storage room on the second floor. The portion of the machine shop which is but one story in height is served by a chain and block suspended from a monorail.

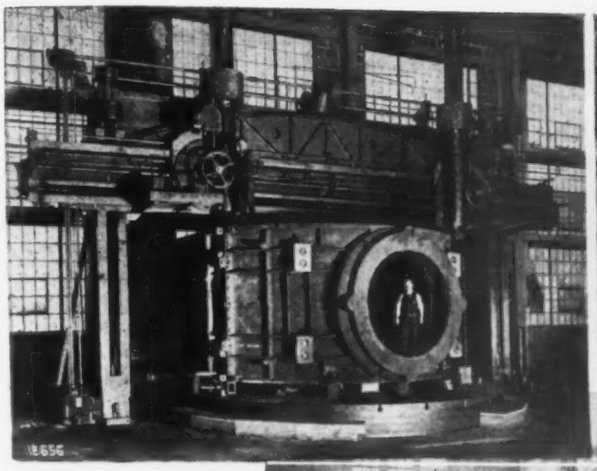
Machine Tools at Fisk Street Station

Machine tools which are available to the overhead electric crane are a 21-in. x 10-ft. engine lathe built by the R. K. LeBlond Machine Tool Co., Cincinnati, a 39-in. x 12-ft. Niles-Bement-Pond Co. engine lathe and a drill press which was moved from the old shop. Other equipment consists of two 18-in. x 6-ft. LeBlond lathes and an American lathe of the same size. Other equipment provided is as follows: A 26-in. shaper built by the Stockbridge Machine Co., Worcester, Mass., a power hack saw, an American 3-ft. 6-in. radial drill, and a milling machine supplied by the Kearney & Trecker Corporation, Milwaukee. At the extreme north end of the room is a blacksmith forge, a bolt-threading machine built by the Acme Mfg. Co., Cleveland, and two pipe threading machines, one manufactured by the Oster Mfg. Co., Cleveland, and the other by the Merrill Mfg. Co., Toledo.

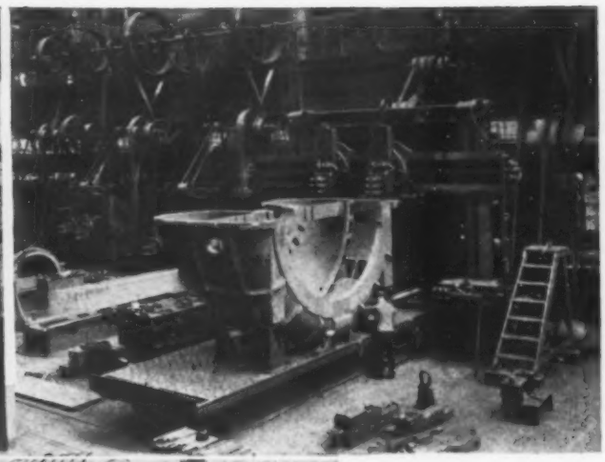
Wide Range of Work Done

The work performed in this shop consists of general maintenance work, from spot facing and drilling small iron and steel castings for coal handling equipment up to the resurfacing of shaft bearings on parts which may weigh in excess of 8 tons each.

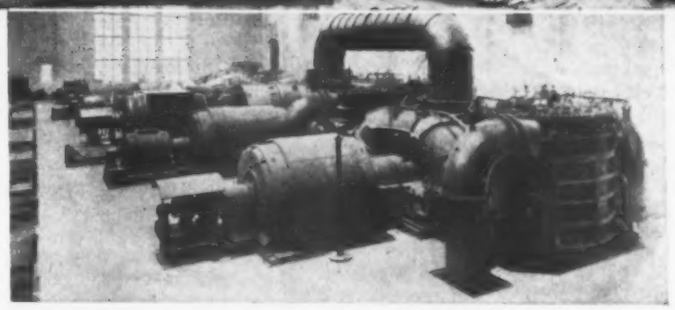
The remainder of the first floor of the building is occupied by the electrical maintenance and service departments, which are now readily accessible to the machine shop and to the stores department, in which are kept all of the ordinary supplies which might be required for a plant of this kind. On the east side of



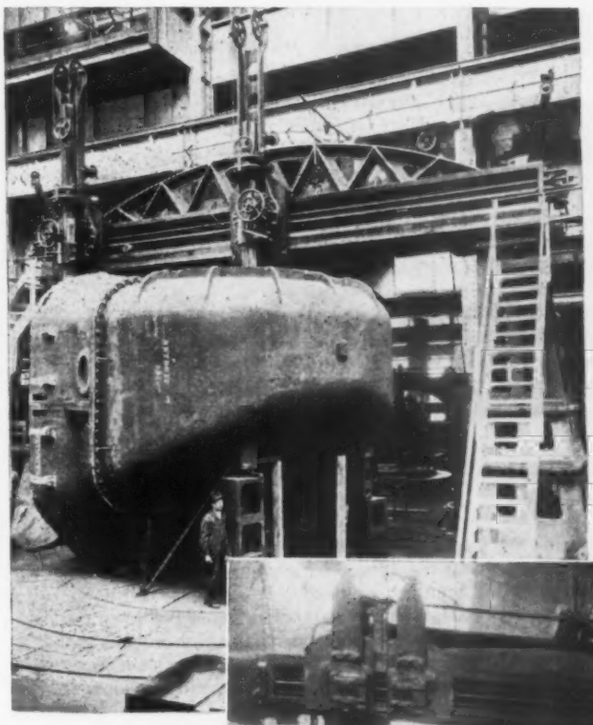
Turbine Auxiliary Parts Which Weigh 100 Tons Each Are No Longer Cause for Wonder. Such a part in a boring mill



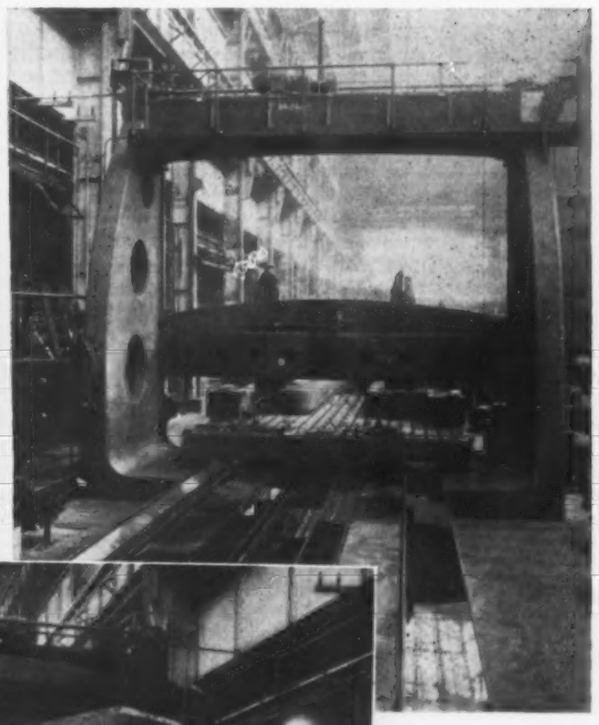
Planer Operations on the Lower Half of a Large Turbine Shell



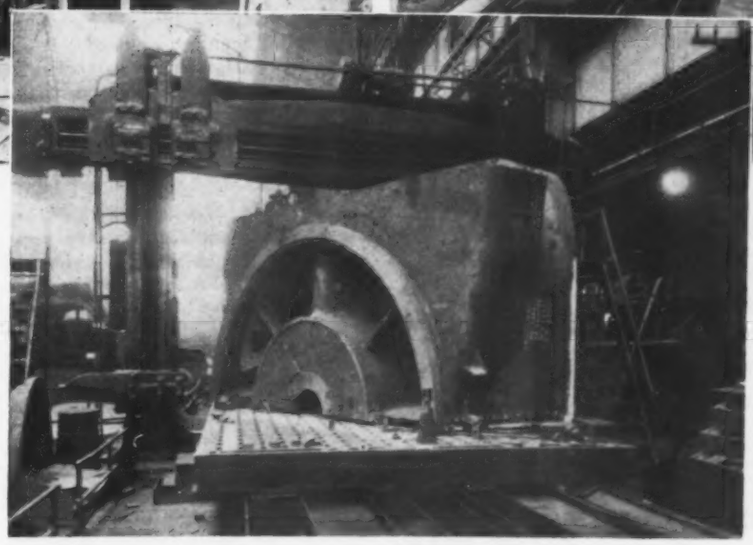
Generating Units of 60,000-Kw. Capacity Are Not Uncommon



The Exhaust Shell for a 45,000-Kw. Turbine Fits Comfortably on the Bed of a 40-Ft. Boring Mill



Planer Operations on a Large Turbine Bed Plate



The Lower Half of the Exhaust Hood for the Low-Pressure Side of a 60,000-Kw. Turbine Installed at the Crawford Avenue Station

the second floor is provided space for offices, a laboratory and a class room. On the west side is the spare parts storage room, where heavy equipment, such as spare motors, crates of motor and generator coils, turbine blades, and bearing caps for the main turbines and generators are stored. A stairway leads from the store room on the first floor to the basement, which is used for the storage of such items as steel stock, spare gears, pipe and pipe fittings, condenser tubes, and numerous types of finished and unfinished castings which are required for maintenance work about the plant. Access to the basement store room is also gained through a hatch in the crane bay of the machine shop. Hence heavier parts may be handled in and out of the storage by means of the overhead electric crane.

The construction of the building was a recognition of the increasing importance both of machine tools and store room in a large central station. It is a convincing demonstration that the position of the machine tool is now well established in the power production field and that even the older plants cannot neglect this phase of their work, to provide uninterrupted service.

Cast Iron from Electric Furnaces*

Duplexing with the Cupola in Germany — Peculiar Properties Observed— Pig Iron Unnecessary—High-Grade Castings from Poor Scrap

As a result of recent technological advances, constantly increasing requirements are being imposed on cast iron as a structural material so that foundries are being compelled to devote greater care to the metallurgy of cast iron in order to meet the specifications for improved physical properties. Attempts during the last few years to produce high-grade cast iron in the electric furnace have met with success so that many foundries have adopted the process.

Duplexing With the Cupola

The writer recently installed equipment in a modern foundry to produce high-grade cast iron by the duplex method.† This consists of a cupola and electric furnace operating in combination. The cast iron produced has a minimum tensile strength of 38,500 lb. per sq. in. and a minimum bending strength of 55,000 lb. per sq. in. A difficulty arose in this case because it was necessary to work with a high-phosphorus charge, whereas high-grade cast iron ordinarily must not exceed 0.30 per cent for its phosphorus content.

Success was obtained by super-heating the liquid iron. It was thus possible to obtain commercially a high-grade cast iron—contrary to the prevalent opinion—with a carbon content of more than 3 per cent and phosphorus up to 0.80 per cent, with improved physical characteristics. Scrap of the poorest quality, high in phosphorus, carbon and silicon, was used without the addition of any pig iron. The high strength values were controlled entirely by super-heating (depending on the composition) to 1500 to 1700 deg. C. (2700 to 3100 deg. Fahr.).

To the extent that certain conditions are fulfilled, especially the removal of slag, cast iron is favorably affected by the super-heating in the electric furnace. This favorable action is greatest at carbon contents between 2.95 and 3.05 per cent. Phosphorus can even exceed 0.80 per cent without injurious effect on the strength tests, which are, however, affected adversely to a minor degree by increasing percentages of silicon.

Unusual Property Noted

A peculiar property of super-heated electric cast iron is noted by the author. If test bars of different diameters are taken from a test plate, an increase in strength values with decreasing diameter was noted. According to previous ideas on the solidification of cast iron, one must assume that the critical temperature for the separation of graphite drops most slowly in the center of the section and that consequently at this point the strength is minimal, due to increased separation of graphite.

The author's experiments, which are not yet conclusive, seem to show, however, that super-heating of the melt alters the cooling phenomena so that the critical separation of graphite occurs in zones from the outside toward the center. As soon as the outside zone of the solidifying casting has reached the critical temperature of graphite separation, the graphite separates; the temperature in the next inner zone is still above the critical temperature. As soon as the temperature drops sufficiently in these inner zones, graphite separates out in them, too. According to the solution theory, however, these inner zones are poorer in carbon, consequently less graphite separates relatively from the outside toward the center. Further experiments are necessary for an exact explanation.

Good Castings from Poor Scrap

The operating procedure, worked out by the writer, made it possible to obtain a cast iron of highly desirable physical properties, irrespective of the composition of the low-grade scrap used, so that production costs of high-grade cast iron were greatly diminished. The method of operation makes it possible to produce ordinary cast iron as well as high-grade cast iron if the electric current prices are reasonable. Current prices and melting costs in the cupola are decisive in determining the economy of the process. The results obtained by the writer with the duplex process showed that the physical properties of the iron were affected not only by the carbon, silicon and phosphorus content, but also by the degree of super-heat, so that these factors determine the improved quality of the product.

Discussion

In the discussion of the paper, it was pointed out by Doctor Kühnel that higher strength values in the interior of a casting were altogether improbable and that the author's results were probably due to defects in the testing machines, which generally give uncertain results for smaller samples. In reply to a question as to whether high-grade cast iron could be prepared directly in the electric furnace, the author replied that in theory it was possible, but that in practice the cost of electric current was too high to permit melting in the electric furnace.

*From a paper delivered by Doctor Kerpely at a session of the electric furnace section of the convention of German foundrymen in Berlin, Jan. 16, 1926. Translated abstract by Albert P. Sachs, New York.

†The first discussion of this process was contained in a paper, "Improving the Quality of Gray Iron Castings by the Electric Furnace," delivered by George K. Elliott, chief metallurgist, Lunkenheimer Co., Cincinnati, at the spring convention of the American Electrochemical Society in New York, April 4, 1919. This paper was printed in THE IRON AGE, April 10, 1919, pages 939-940.

A rather high sales level during March is needed to keep the automobile industry in sound condition as to stocks of unsold cars, in view of the large output of vehicles in February and the record rate at which a majority of the large producers are turning out cars this month, according to *Automotive Industries*. Sales in February were satisfactory, considering the season of year, but the heavy snowstorms were strongly unfavorable factors in some sections of the country.

The number of exhibitors at the Swiss Industries Fair, Basel, Switzerland, April 17-27, will evidently be large. The three exhibition halls erected after the fire of 1923 are again booked to capacity, according to the Swiss Consulate at 104 Fifth Avenue, New York.

Delving into Metal Structures

Hitherto Unpublished Technique Involves New Etching Solutions for Steel, Copper and Aluminum Alloys —Notable Results Achieved

BY J. R. VILELLA

THE scope of metallography demands of etching reagents more than mere ability to act selectively and to differentiate distinctly between the various constituents of metallic alloys or the individual grains of pure metals or homogeneous solid solutions. It requires reagents capable of disclosing the history of crystallization by revealing the presence of any traces left by structures that existed during the process or the development through which metallic aggregates pass as they cool from a molten condition.

The state of unstable equilibrium of metallic alloys brings about conditions of chemical inhomogeneity within the grains that require reagents capable of revealing the presence of dendrites, cores, precipitates, products of eutectoid transformations, partial or complete dissociation of compounds and such other conditions as might result from a state of imperfect equilibrium. The various mechanical operations involved in the production of alloys and pure metals call for reagents which can reveal such deformations of the individual grains or of the total structure as might persist even after recrystallization has been brought about by subsequent heat treatments.

Fig. 1

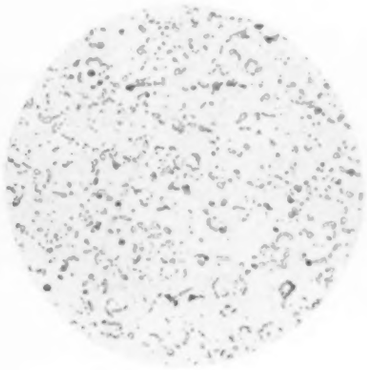


Fig. 2

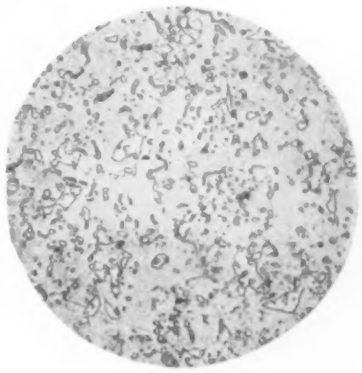


Fig. 3

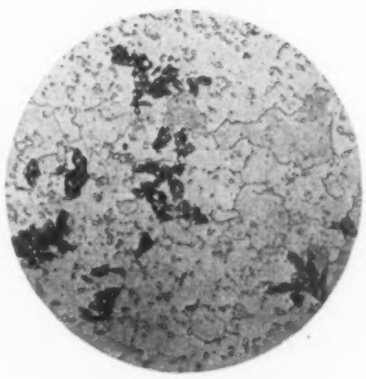


Fig. 4

Fig. 1—Structure of a 27 per cent chromium, 3.95 per cent carbon alloy, etched by simple immersion in a solution of aqua regia in glycerine. Fig. 2—Low-carbon alloy etched with Murakami's reagent. Fig. 3—Same alloy as Fig. 2, etched with boiling 10 per cent hydrochloric acid. Fig. 4—Same alloy as Figs. 2 and 3, etched with aqua regia in glycerine. All were magnified 100 diameters

In the presentation of the etching problems discussed in this paper, for which no satisfactory technique has been previously established, the subject will be divided into three main groups:

I. The etching of iron-chromium base alloys.

II. The use of chromic plus hydrochloric acid as an etching reagent for copper alloys.

III. The etching of aluminum and its light alloys.

The group of metals, known as the iron-chromium

THIS is the first of a series of three important articles dealing with the discovery of new etching reagents and polishing methods. These serve to bring out metal structures hitherto undeveloped. The scientific and practical value is evident.

The work is the result of researches by the author, who is a member of the technical staff of the Union Carbide & Carbon Research Laboratories, Inc., Long Island City, N. Y.

This article deals with the effect of aqua regia in glycerine as an etching medium for chrome-iron alloys.

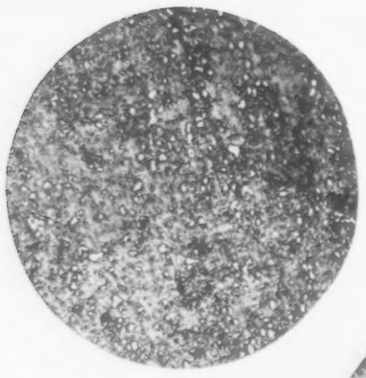
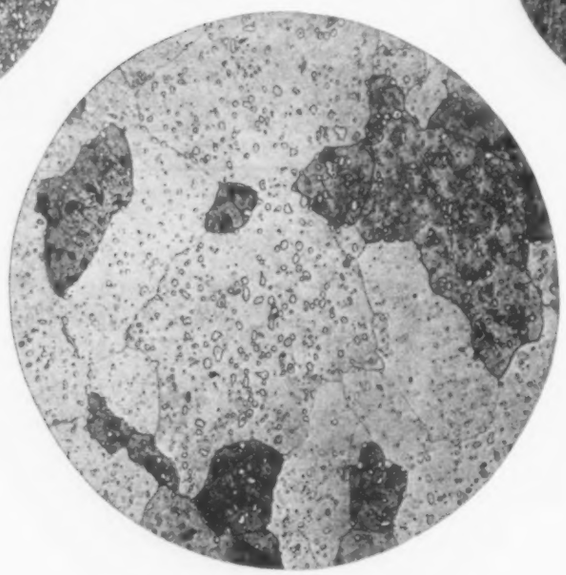


Fig. 5 — Appearance of the structure after the first etch with aqua regia in glycerine. X 100

Fig. 7 (Below)—Appearance after the specimen has been re-polished and re-etched three times. X 100



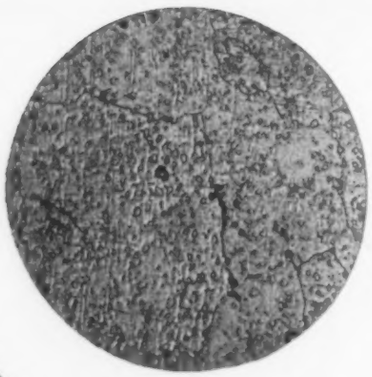


Fig. 6 — Appearance after re-polishing and etching. X 100

base alloys, includes alloys of iron, chromium and carbon, such as rustless iron, stainless steel and chrome iron, as well as nickel-chromium alloys. The chemical composition of these alloys varies widely, ranging from zero to 60 per cent chromium, from 0.06 to 4 per cent carbon and from 0.10 to 60 per cent nickel. Iron-chromium base alloys containing appreciable amounts of silicon, tungsten or molybdenum have also been etched in a satisfactory manner by the method to be described. The method is likewise applicable to Hadfield's manganese steel.

The resistance of these alloys to the action of various etching reagents depends primarily on their carbon content, those high in carbon being more susceptible to chemical attack. High-carbon alloys are also harder and can be polished readily without danger of distorting the surface metal. These alloys require but a slight attack in a suitable reagent to reveal their true

Fig. 8

Fig. 8—Alloy, 20 per cent chromium, 0.25 per cent carbon, quenched in water from 1200 deg. C and drawn at 650 deg. C., showing austenite, martensite and troostite. X 100. Fig. 9—Alloy, 12 per cent chromium, 0.30 per cent carbon, quenched from 1185 deg. C., showing martensite. X 100. Fig. 10—Alloy, 28 per cent chromium, 0.25 per cent carbon, quenched from 1350 deg. C., showing delta iron, precipitation of carbides and double crystallization. X 100. Fig. 11—Alloy, 30 per cent chromium, medium carbon, showing decomposition of austenite. (troostite) X 100

Fig. 9

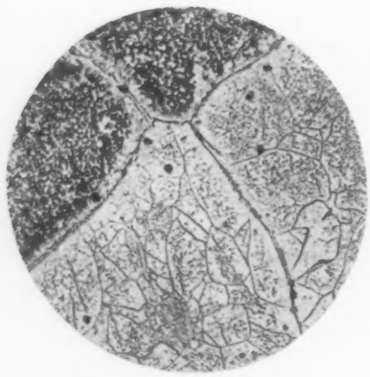


Fig. 10

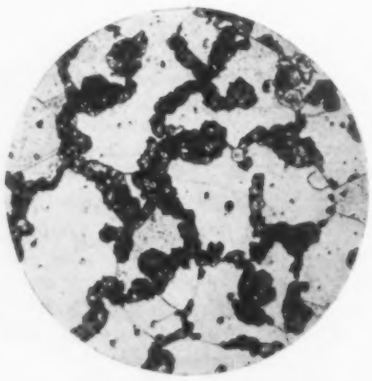


Fig. 11

structures, while softer alloys, whose surface metal is easily distorted during the polishing operation, do not reveal their true structures until all the distorted metal has been removed.

The resistance to the action of etching reagents of alloys containing nickel or manganese increases suddenly when the alloys become entirely austenitic, austenite being the most difficult structure to develop. The effect of carbon works in two directions—by promoting the retention of austenite it retards chemical action, but accelerates the attack when present in excess of the saturation point of austenite.

The effect of variations in chromium as well as the other elements mentioned above is negligible and can be disregarded.

While casting about for an etching reagent capable of disclosing the structural transformations brought about by the heat treatment of low-carbon iron-chromium base alloys, several photomicrographs of iron-chromium alloys etched with a solution of "aqua regia plus glycerine" were noticed in "Metallography and Macrography" of Guillet and Portevin, translation of Carpenter, plates Nos. LXVIII and LXIX. Outside of that reference, the reagent is not mentioned again in the text. The excellence of the photomicrographs led to an investigation which resulted in developing a technique that produced etching effects superior to all expectations.

Previous to this investigation the etching of iron-chromium base alloys was done in Murakami's reagent if the distribution of carbides was the only information sought, and in boiling 10 per cent hydrochloric acid when it was desired to develop the microstructures. The last mentioned solution was considered the most dependable of all the reagents suggested for etching low-carbon alloys. As an etching reagent, however, it lacks the sensitiveness necessary to reveal all the structural changes brought about by heat treatment, and its use frequently results in considerable pitting and staining of the prepared surface. Figs. 2, 3 and 4 illustrate the structures developed by the above mentioned reagents.

The alloy used for this comparison contains 25 per cent chromium and 0.25 per cent carbon. It was heated to 1100 deg. C. and quenched in water. The section was etched first in aqua regia in glycerine, repolished lightly and etched in boiling 10 per cent hydrochloric acid, repolished again and etched in Murakami's reagent. The dark areas of Fig. 4 when examined at high power, are found to be patches of martensite. In Fig. 3 these areas cannot be distinguished from the carbide particles, except perhaps by their size.

The solution of aqua regia in glycerine consists of:

1 part by volume of nitric acid;
2 parts by volume of hydrochloric acid;
3 parts by volume of glycerine.

It is prepared by adding the acids separately to the glycerine. If the acids are mixed first, a considerable evolution of chlorine takes place and the reagent becomes too rapid in its action, tending to produce etching pits. It must be used when fresh and discarded as soon as it turns brown in color.

The limited application that this reagent has received is due, probably, to the fact that a simple immersion of the specimen in the solution does not yield results superior to those obtained with the other reagents mentioned in this paper. Low-carbon alloys being soft, suffer considerable structural alterations of the surface metal during the polishing operation and require that all distorted metal be eliminated before the unaltered structures appear.

This can be successfully accomplished by the following method of alternate polishing and etching: The specimen is polished first with as little pressure as possible and etched for about 30 sec. in the freshly prepared reagent, re-polished again on the last abrasive (rouge or levigated alumina) until the mirror finish is regained, and re-etched. After the third etch the structures usually appear distinct and sharply outlined, but frequently it is necessary to repeat the operation several times more. The progressive development of the true structure of a soft, low-carbon, iron-chromium alloy is illustrated in Figs. 5, 6 and 7.

The layer of altered metal is partly removed by the reagent, while the succeeding light polishing prevents the rough surface that would result from a long-continued chemical attack.

The results obtained by the method of alternate polishing and etching have not been duplicated by etching with any other of the reagents. The ability of acting selectively and developing the slightest structural variations seems to be inherent in aqua regia in glycerine and establishes this solution as an ideal reagent for etching low and high-carbon iron-chromium base alloys. The great possibilities of this reagent can be seen by the photomicrographs, Figs. 8, 9, 10, 11, 12 and 13.

Figs. 8, 9, 10 and 12 have already appeared in an article by E. C. Bain on "The Nature of the Alloys of Iron and Chromium" in the January, 1926, issue of the *Transactions American Society for Steel Treating.*

(The second article will deal with the effect on copper alloy of chromic acid containing small amounts of hydrochloric acid.)

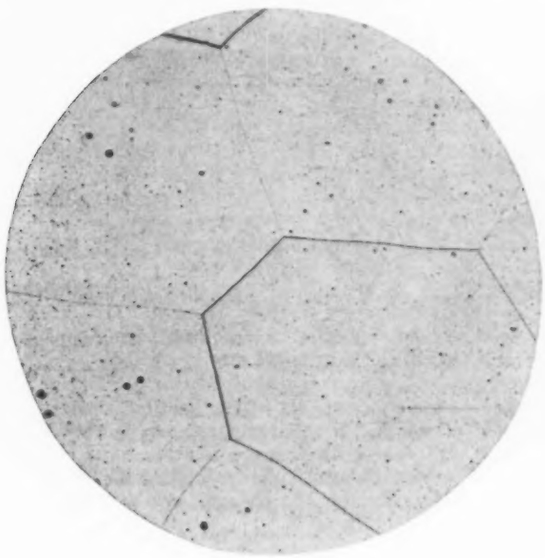


Fig. 12

Fig. 13

Fig. 12—Decarburized area of a 20 per cent chromium, 0.50 per cent carbon alloy quenched from 1410 deg. C., showing pure delta iron solid solutions. X 100. Fig. 13—Iron-chromium-nickel alloy, quenched from 900 deg. C., showing austenite. X 100

Carbonizing and Hardening Steel

Automatic Electric Furnaces for Treating Automobile Parts at Large Detroit Motor Plant—Forward Step in Heat Treating

CONTINUOUS electric furnaces of the pusher type for carbonizing automobile gears and pinions have recently been placed in operation by the Hudson Motor Car Co., Detroit. Two of these furnaces are now in use, one for carbonizing pinions and differential side gears, and the other for carbonizing ring gears. Four others are about ready for operation for other carbonizing work. These furnaces represent an important forward step in electric heat-treating furnace design as an aid to mass production, resulting in work of more uniform quality and a marked saving in labor. They were designed and built by Holcroft & Co., Detroit. The furnaces are 12 ft. wide and 67 ft. long and have heating chambers 6 ft. wide and 55 ft. long. The table extends 6 ft. beyond the furnace proper at each end, providing space for loading and unloading.

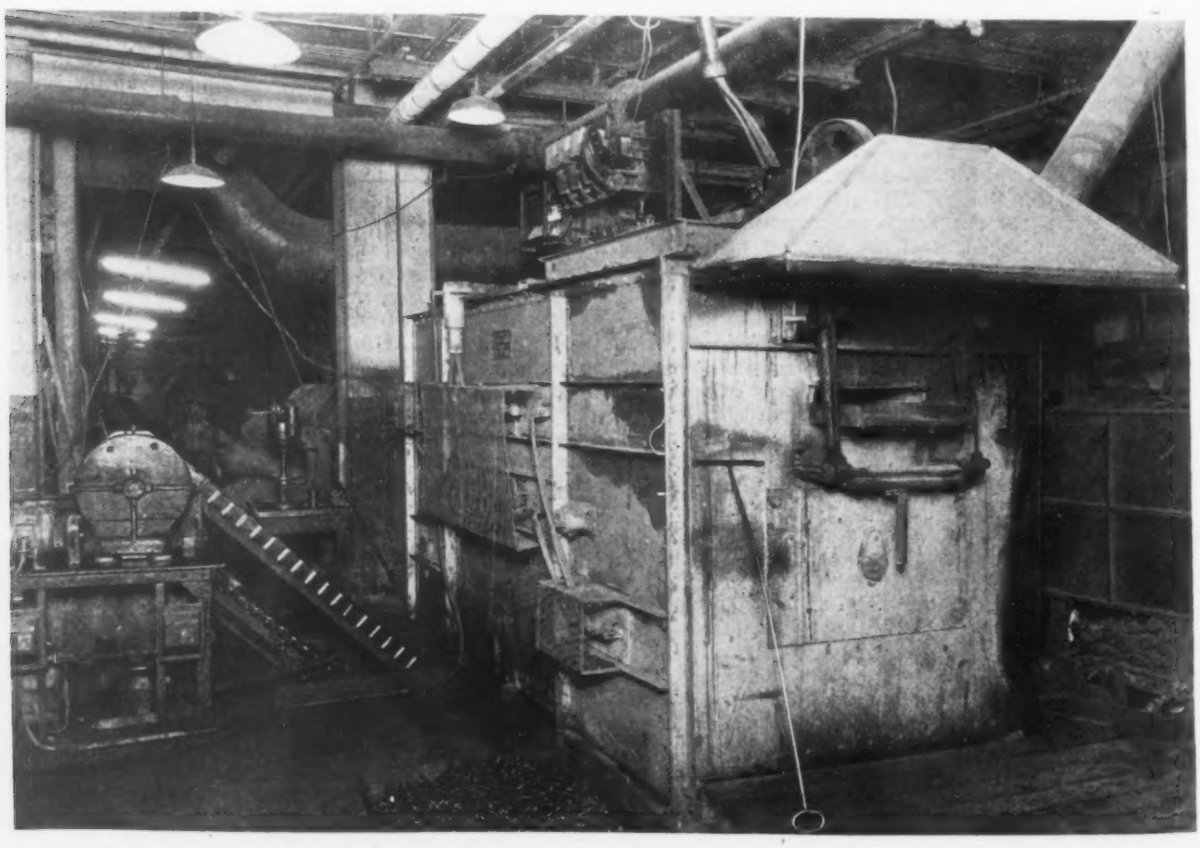
The new types are "counterflow" furnaces of the pusher type. The work moves in both directions in two lines, each end being both a loading and a discharging end. The furnace chamber is divided into five zones: A pre-heating zone, a zone for coming up to heat, a zone for holding the heat and two cooling-down zones. The last two zones for work going into the furnace in the opposite direction become pre-heating and coming-up-to-heat zones.

The average carburizing temperature for producing a 0.055-in. depth of case is maintained 15 hr., with the work kept in the maximum heat zone about 9 hr., leaving 3 hr. each for pre-heating and cooling. For a 3/64-in. case, work is kept in the high heat zone 20 hr. Some work requires keeping the boxes in the holding temperature zone up to 27 hr. The furnace temperature ranges from 1650 to 1800 deg. Fahr., depending on the material that is being carbonized, the depth of case and carbonizing compound.

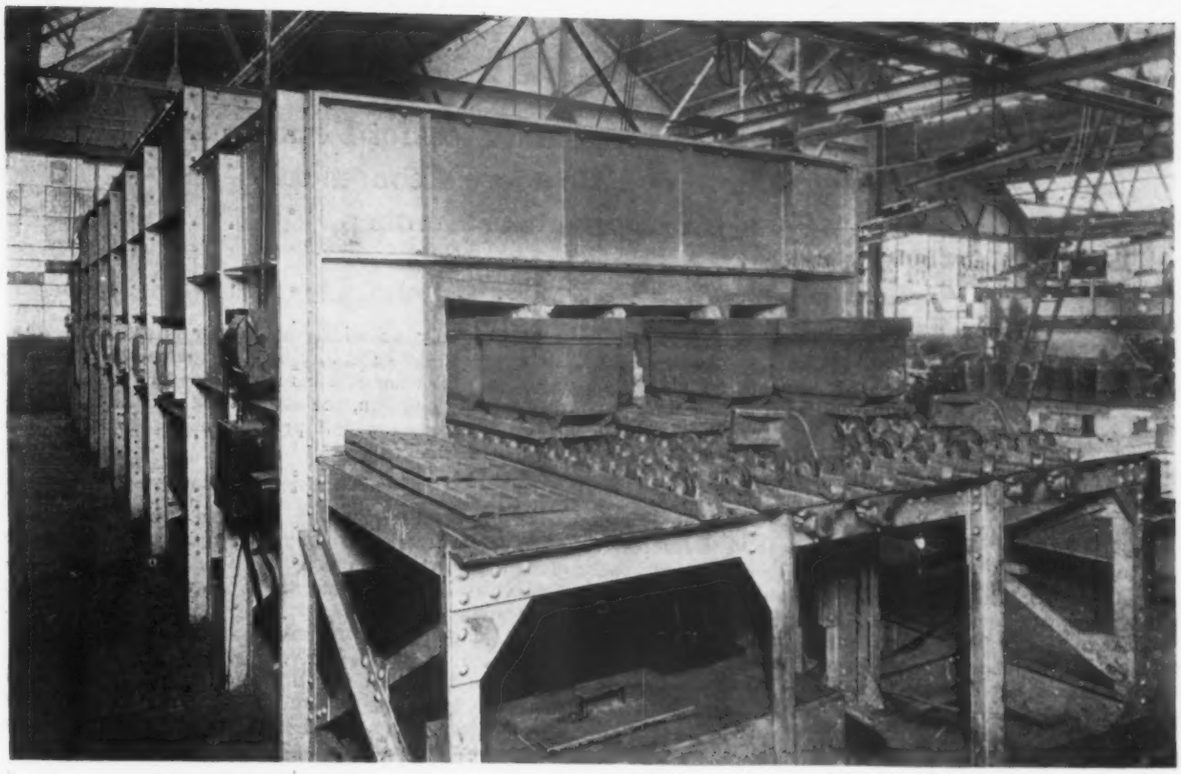
The carbonizing pots are set on carriers on which they move through the furnace on 4-in. rollers set on 6-in. centers, the rollers being mounted on U-shaped rails. The carriers have a guide track on one side and are flat on the other. The rails and rollers extend to the end of the tables at each end. Work is loaded on and unloaded from the tables with an electric hoist operating on a monorail. The carbonizing boxes used for pinions and side gears are 20 in. long, 10 in. high and 10 in. wide. Those for the ring gear furnace are 19 in. high and 15 in. in diameter. New boxes are being provided with a guide track on the cover and these will replace the present carriers. When these are used the pots when loaded will be turned upside down on the carrier track. The rollers and rails are of nichrome and the carbonizing boxes of the same material as well as of other high heat resistance material.

In average operation the work travels 9 min., moving about 5 in. in that time, and then the pusher is idle for the same length of time. However, the travel and speed can be regulated, as required, by means of a variable speed and automatic timing device.

The furnace has 18 removable heating units, six in each pre-heating zone and six in the holding zone. The ring gear furnace has a rated capacity of 310 kw. and the pinion and side gear furnace a rated capacity of 270 kw. The temperature is controlled by three Leeds & Northrup instruments, one on each pre-heating zone and one on the holding zone. The output of each fur-



Conveyor Type of Electric Furnace for Hardening Small Parts. The work drops from the furnace into a quenching tank beneath, from which it is elevated by the conveyor at the left



Continuous Pusher Type of Electric Furnace for Carburizing Ring Gears, Pinions and Differential Side Gears

nace is approximately 17,500 lb. of work in 24 hr. The parts carbonized range from small gears and pinions weighing 1¼ lb. up to ring gears weighing 19 lb. About 100 lb. of work is placed in each carbonizing pot.

Savings in Labor and Overhead

Each furnace replaces six box type furnaces, and its operation requires one attendant and a helper who does the packing. As each box type furnace took one attendant, each electric furnace means a saving of four men.

In addition to a saving in labor and overhead, the continuous electric carbonizing furnaces are said to have other advantages over the box type furnaces, particularly in that, because of the uniformity of heat and cooling, the quality of the work is better. With the old furnaces three days' stock of carbonized gears was carried ahead of the production line, but with the even flow of material through the continuous furnaces, it is not regarded as necessary to carry carbonized stock for over two days' requirements. The furnaces are operated 24 hr. per day and the heat in one has been turned off but once since it was started last June. On Sunday, when the furnaces are not operated, empty carbonizing boxes are run into the high temperature zone where they are allowed to stand still until the operation of the furnace is resumed.

In connection with the two carbonizing furnaces there are roller tables and other equipment for packing, cooling and dumping the carbonizing boxes. The tables, consisting of several lines of 18-in. rollers side by side, are in two sections approximately 60 ft. long, connecting at the center with a dumping and packing platform. The compound is dumped from the boxes into a cast iron tank and is pumped from this tank into an overhead tank and discharged by gravity into a packing hopper above the platform. From this hopper it is fed through a hose back into the carbonizing boxes. One standard grade of carbonizing compound is used and new material is added in the proportion of one-third new to two-thirds old. A hood is provided above the dumping platform to carry away the fumes and heat. The packing and dumping tables are located between the two furnaces, one unit serving both furnaces.

Another furnace of new design in the heat-treating department of the Hudson Motor Car Co. is a conveyor type of continuous furnace for hardening small parts. Heretofore these have been hardened in cyanide pots and drawn in nitrate of soda. This furnace is used for heat treating motor head studs, connecting rod bolts, bearing bolts and flywheel bolts made of nickel steel. It is 12 ft. 4 in. long, 6 ft. wide and 7 ft. high, outside dimensions. The furnace chamber is 9 ft. 6 in. long and 2 ft. 9 in. wide.

Work is carried through the furnace on an endless conveyor, from which it drops through a chute onto another conveyor in an oil quenching tank 12 ft. deep beneath the furnace. As the discharged end of the chute is under oil, a draught of air cannot pass up the chute into the furnace chamber. The conveyor in the quenching tank elevates the work at an incline to the side of the furnace, where it is dumped into shop barrels. Work is now shoveled into the furnace and drops onto the pans of the conveyor, but it is the intention of the company to equip the furnace with automatic feeding apparatus. A duplicate of this furnace will be installed for drawing the same parts as they come from the hardening furnace.

Work is heated to a temperature of 1480 deg. and is kept in the furnace 30 min. It is discharged into the shop barrels after quenching 45 min. after it is charged into the furnace The capacity of the furnace is 500 lb. per hr. It has a rated capacity of 130 kw. and uses 220 volt, 3-phase current. The heating units are located both between and over the top of the conveyor, so that the heat reaches the work from both sides. It is automatically controlled by a Leeds & Northrup instrument located on the top of the furnace. This furnace takes the place of 10 cyanide pots. Its operation requires one man as compared with three men that were required for the operation of the cyanide furnaces.

The national tractor meeting, which was scheduled to be held in Chicago on March 25 and 26 under the joint auspices of the American Society of Agricultural Engineers and the Society of Automotive Engineers, has been postponed by agreement of the two societies. After a careful canvass of the situation, it was decided that autumn will be a more suitable time for the meeting than early spring, and the dates for a fall meeting are to be announced later.

The Dwellings of Tomorrow

III.—Why the Use of Iron and Steel for Residential Construction Will Be More Economical Than Employment of Lumber

BY PRENTICE WINCHELL

One of the Steel-Frame Houses Erected by C. H. Dexheimer & Sons, Toledo, and Described Last Week

ONE of the stock questions customarily asked the exponent of iron and steel for house building is this: "Won't it cost too much?"

Briefly, it won't. But such a statement requires some elaboration in the case of a radically new type of building material. The specific examples of the use of metal in house building which THE IRON AGE is now publishing constitute one answer to this question. In many widely-scattered instances, iron and steel have been used with economy. But even these examples of actual facts do not present the picture in its true light. The expense of producing a single steel-frame house, as in the case of the house at Tarrytown, N. Y., described in this issue, is quite out of proportion to the expense of producing any one of 1000 such houses, which might well be built on the same general system although according to widely-varying plans. The cost of designing and manufacturing the various frames and panels used in this Broderick house, for instance, would probably be reduced very materially when manufactured in quantities.

Consequently it is pertinent to inquire what the possible savings might be if iron and steel construction were generally or widely employed as well as what the savings may be in any initial experiment. Accordingly the following reasons are set down for assuming that, in the long run, the use of iron and steel in residential construction will prove more economical than the use of wood:

*THE IRON AGE, New York

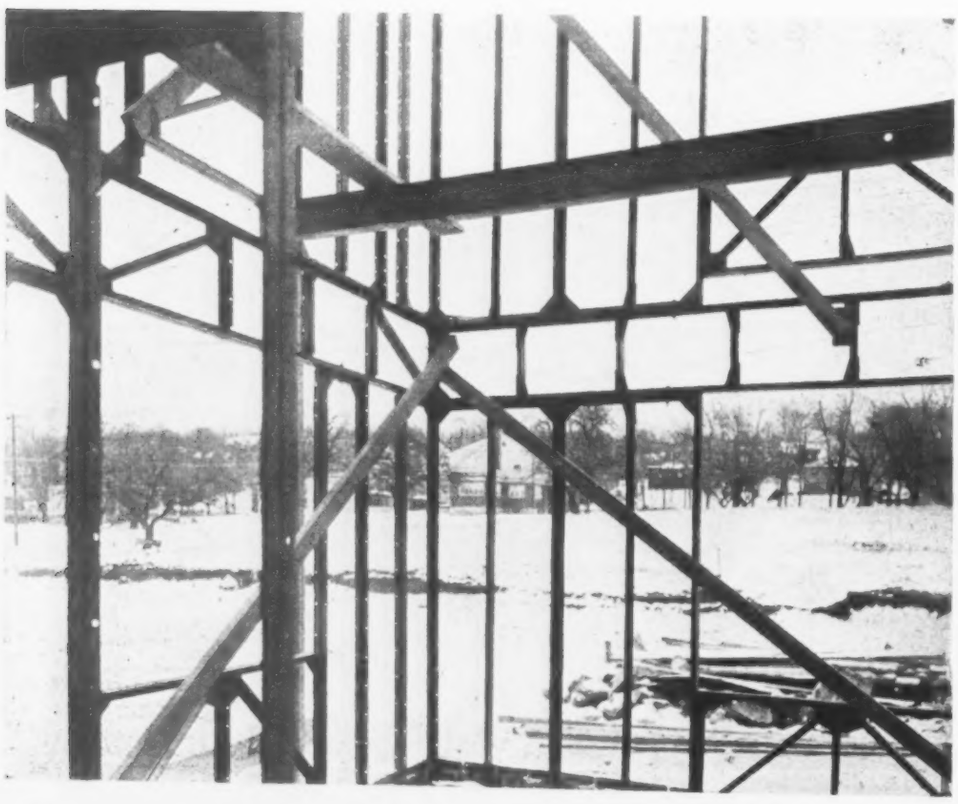
Ten Reasons for Steel

1. The development of standard, unit-type, interchangeable metal parts adaptable to any ordinary house plan will permit the use of large-scale factory production with all the advantages of material-handling and labor-saving devices, and possibly automatic machinery, in the plant before assembly, rather than expensive hand labor on the job. Every step in the process of building a house which can be transferred from a field to a shop operation without impairing the freedom of architectural design or the quality of construction is a step toward home-owning economy.

2. Mechanically produced, accurate and interchangeable unit-type parts will mean more rapid erection of houses after construction has begun, thus saving an appreciable portion of the labor-cost of erection.

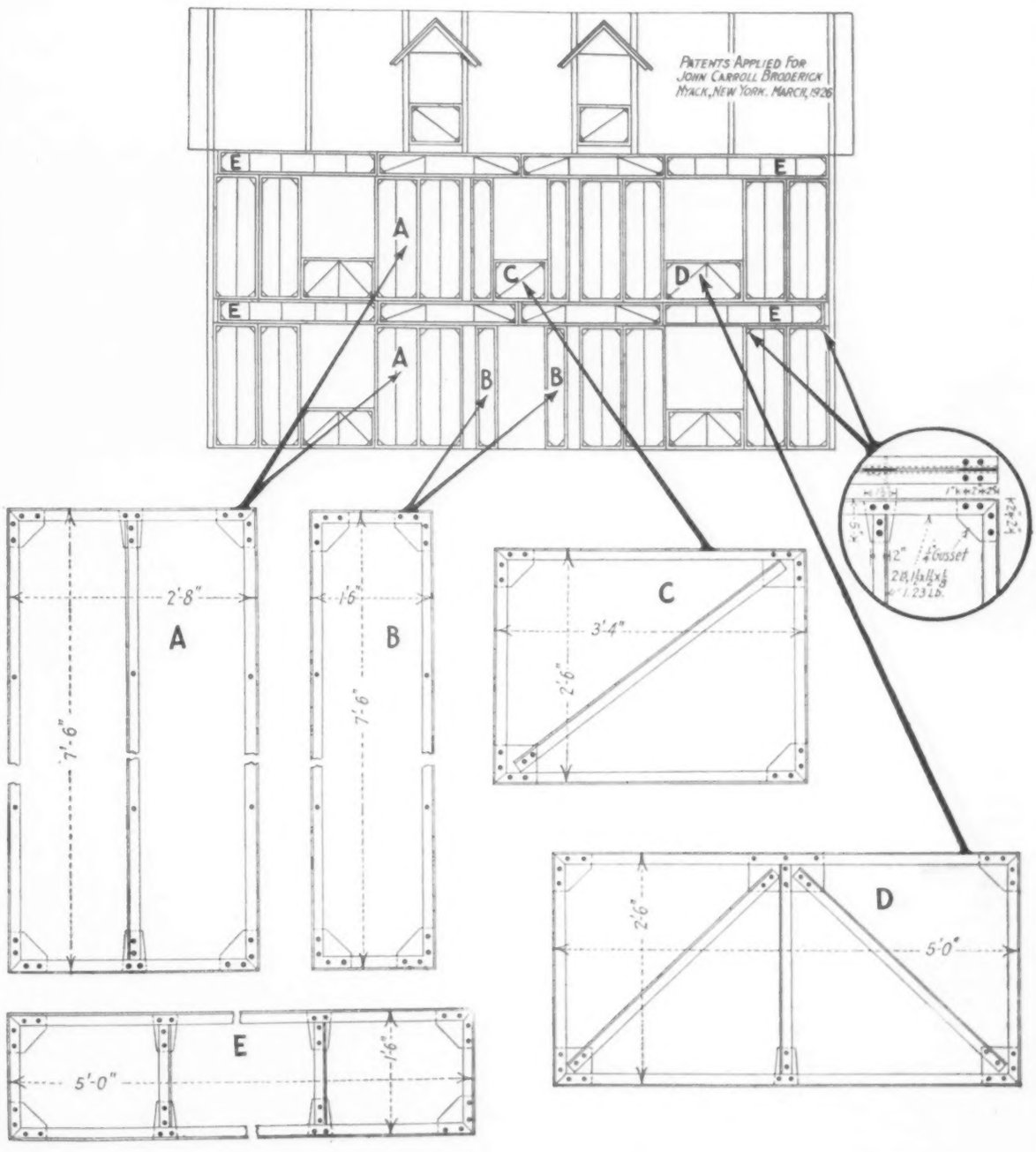
3. The comparative simplicity with which such iron or steel parts may be erected as against wooden parts will make possible the employment of less skilled labor than that now employed and thus reduce the actual cost of building, while very possibly permitting an increase in the wages of the labor thus advanced to a semi-skilled position in the building trades.

4. In the case of severe or unjustified strikes, such a system of iron and steel parts for houses is calculated



A Close-Up of the Steel Frames Used in the Construction of the House at Tarrytown, N. Y., described in THE IRON AGE, *March 4. Some of the temporary wood bracing is shown as used in the erection of this first experimental house. Walls are brick veneer with air space and insulating material, the plaster being applied directly to the insulating material. Details of the construction are shown on the opposite page*

System of Standard Unit Steel Construction



A SYSTEM of interchangeable unit-type steel frames is used in the construction of the model steel dwelling recently erected at Tarrytown, N. Y. The system, as described by Mr. Broderick, consists of "a series of steel frames formed of bars, riveted in the shop, brought to the site and bolted together. Any person familiar with a monkey wrench, plumb line and carpenter's square can readily erect the frame in position according to the desired plan. The punching in the frames (not shown in the illustration) is so arranged that each frame will go into position and register with the holes in the adjoining frame. Each side and end are interchangeable. As the frames are made square, straight and true, it is impossible to erect them, except in proper position with relation to the rest of the structure."

Material employed in this structure was standard steel bars, ordered from warehouse stock, cut and riveted in a local shop. Between the angles on each frame, at the corners, are riveted ¼-in. gusset plates and ¼-in. fillers or spacers are used to render the frames more rigid in the vertical dimension. Bolts used in field erection are ⅜-in. throughout, from 1 to 4 in. in length.

Two types of upright frames, A and B, are standard, and by means of varying spaces between these frames, any desired wall or partition plan may be employed. The window fillers, C and D, are also standard units. The girts, E-E, are made in 4, 5 and 6-ft. lengths, as desired.

Ordinary structural floor beams were employed in this house, although lighter steel joists or steel lumber is equally adapted to the system.

to make possible the continuance of needed housing projects, thus avoiding the tying up of capital over long periods.

5. With properly designed interchangeable, unit-type parts for frame, partitions, flooring, walls, etc., there should be much less waste of materials on the job than in the case of lumber, which has commonly to be sawed to length, with a considerable loss.

6. Because much of the work required to produce a house would be factory work rather than field work, production could easily be distributed over the year to do away with the evils and expenses of seasonal slumps and booms. Unemployment could be minimized and production costs lowered by manufacture for stock in the off months.

7. Building materials constitute one of the chief burdens on our transportation systems. Both on account of the comparative bulk of lumber as compared with iron or steel of equal building strength and because of the element of waste previously mentioned, the use of metal for houses will require fewer ships, trucks, freight cars, etc., than would be needed for wood.

8. The terrific cost of fire (which must be borne, eventually, by every individual in the country, including home-builders and owners) will eventually be greatly reduced by the use of fireproof types of construction employing metals. Individual insurance rates will, presumably, also be lowered as risks decrease.

9. Iron and steel when used for building materials will have a much larger salvage value (in the case of a house which is to be torn down or replaced) than in the case of wood. The material used in the average wooden house has low salvage value, because of the difficulty of using it again, whereas iron and steel could either be used again in the form of building material or sold to the steel mills as scrap.

10. House for house, the upkeep on a steel or iron frame, floor, roof, etc., properly constructed, will be much lower than the cost of similar upkeep in the case of wood, because deterioration will be slower and replacement easier than would be experienced in the case of lumber.

The use of irons or steels which are strongly resistant to corrosion; the careful application of paints to prevent rusting; the protection of the metal from unnecessary exposure to the weather—all these have been considered in this country and abroad and it may be safely said that the probability of steel's deteriorating in a properly designed and constructed house will be far less than the certain deterioration of wood which might be similarly employed.

Steel can be used today, even in small and experimental quantities, in place of wood for many parts of the house to definite economic advantage. Who can estimate the savings to the home-owning and rent-paying public when iron and steel have come into their own?

Safety in Crane Operation

Steel Plant Engineers Discuss Methods of Avoiding Accidents—More Than 300 Attend Meeting in Pittsburgh

Every phase of steel plant crane operation came in for attention at a safety congress held at William Penn Hotel, Pittsburgh, Wednesday, March 10, under the auspices of the safety division, Association of Iron and Steel Electrical Engineers. There was a registration of more than 300, which included not only electrical engineers and safety directors of steel plants from the various producing districts of the Eastern half of the United States, but a liberal representation of the crane builders. The general subject of the conference was, "The Safe Operation of Electric Overhead Traveling Cranes." There were no formal papers on the various divisions of the subject and there was a similar absence of formality about the discussions. The exchange of ideas must have been helpful to all present. C. L. Baker, Bethlehem Steel Co., Johnstown, Pa., was chairman of the meeting.

The morning session was given over to crane operators, their physical and mental requirements and their selection and training. There was discussion as to whether the principal responsibility of crane operation rested with the man in the cab or the man on the floor and whether it was the best course to employ experienced operators or to train new ones. The latter plan was favored by most speakers, because the experienced man usually is a "floater" and that usually meant a short stay and the necessity of frequent replacements. R. G. Adair, safety director American Rolling Mill Co., Middletown, Ohio, outlined the plan followed by his company, which calls for the training of its own operators. Work on the floors below the cranes usually develops a desire among the floor men to operate a crane. The man who wants to make a change has merely to advise his foreman, who in turn presents the application to the safety department. The candidate then is given a physical examination and a mental test and if he passes is given a card which entitles him to trial, riding with an experienced operator first to learn the control and later to operate under the direction of the operator.

The afternoon session was devoted to cranes, crane runways and to the rules governing operators and directors. Gear guards and ropes had much attention. It was the opinion of most speakers that the gear guard problem, from the standpoint of ready inspection, still is unsolved. The elimination of danger from falling crane parts was a matter of educating the men below the cranes to look for trouble before it happened. There were varied expressions as to rope failures and what is being done to insure safety. Generally the practice on hot metal cranes is to change the ropes on the first sign of broken strands, but usually to change after not more than six months' service. Too frequent changing was not desirable from a cost standpoint and one speaker mentioned the plan of his company, which had established the life of the cable on a tonnage basis and was successfully replacing on that basis instead of at stated times. It was said by one speaker that few spills were due to rope failure and more frequently were due to hook and trunnion failures.

Discussion of sanders for runway and rails brought out a suggestion that one plant was using oil treated waste instead of grease and this was making the runways safer for repairmen by eliminating the danger of slipping in the grease.

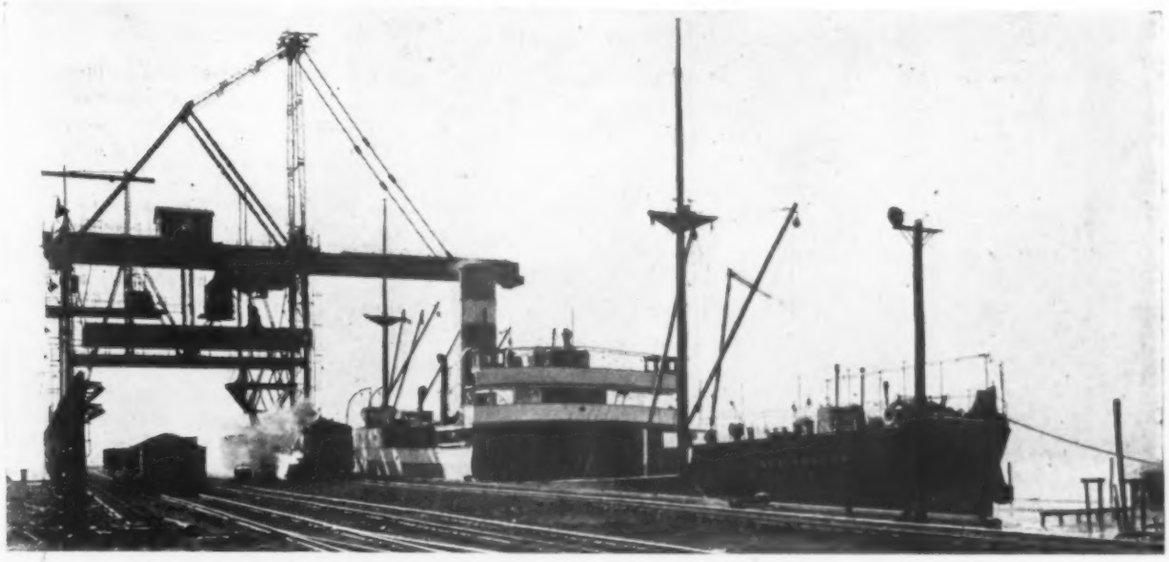
Commemorating the First Successful Incandescent Lamp

"Electric Night by Radio," issued by the General Electric Co., Schenectady, N. Y., contains the addresses broadcast on Oct. 21, 1925, from 18 broadcasting stations, covering the United States. This national celebration was to commemorate the forty-sixth anniversary of the incandescent lamp and to pay tribute to Thomas A. Edison.

History, progress, rural electrification, public relations and many other subjects relating to the electrical industry were discussed. Among the 32 speakers were Herbert Hoover, Secretary of Commerce, and William M. Jardine, Secretary of Agriculture, in addition to officials of banks, electrical associations, central station companies and manufacturers.

The Purchasing Agents' Association of Rochester, N. Y., will hold a dinner meeting March 31 at quarters of the Rochester Chamber of Commerce. Dr. Samuel W. Stratton, president Massachusetts Institute of Technology and formerly director Bureau of Standards, Washington, will be the chief speaker.

Foreign iron ore is unloaded from ships and transferred to the ore storage bins on cars, resulting in a considerable saving per ton of iron, as compared with the former method of unloading the ore at Philadelphia and transporting it by rail to the furnace



Cuts Blast Furnace Costs

Delaware River Stack with New Equipment and Ore Dock Able to Meet Competition of Foreign Iron

DIFFICULTIES which have beset all makers of pig iron on the Atlantic seaboard in meeting the competition of low-priced foreign iron, and which were outlined in an article appearing in THE IRON AGE, Dec. 17, 1925, page 1657, have been effectively met by the Delaware River Steel Co., Chester, Pa., which has saved materially in its cost of making iron by the rebuilding and modernizing of its furnace, together with the construction of a deep-water dock with modern ore unloading equipment.

The furnace has for some time been using foreign ores almost exclusively, but the lack of docking facilities made it necessary for the ore to be unloaded at Philadelphia, entailing additional transportation and unloading costs. Taking advantage of its tidewater location, the company in 1923 began a program of improvements which were not completed until August, 1925. Since then the furnace has been producing continuously foundry, malleable, basic and copper-free low phosphorus iron, and the results, in the opinion of the company's officials, have fully justified the expenditure of the additional capital.

Furnace Output Almost Doubled

The new equipment has increased the output of the furnace from about 63,000 tons to 120,000 tons a year, while the use of self-fluxing ores, which are chiefly obtained from the Mediterranean district, has cut down on the limestone charge, and this in turn has resulted in lower coke consumption per ton of iron.

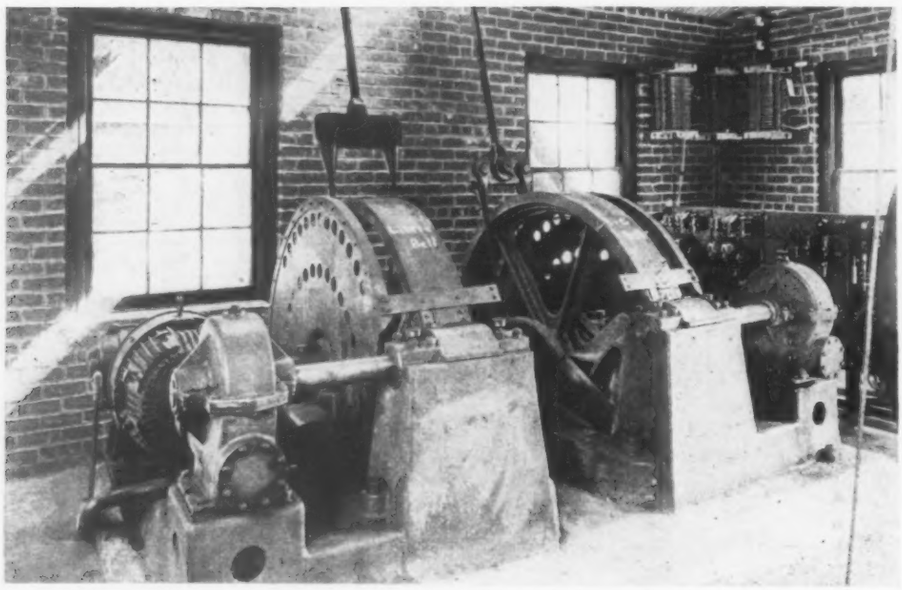
The building of a deep-water dock was the first important step in the rehabilitation program. A channel, which affords 27 ft. depth at low tide, was dredged and a pier 430 ft. long, built on piles with the face and two sides of concrete, was designed and constructed by J. E. Brenneman & Co., Philadelphia. On this pier an unloading machine of the Brown Hoisting Machinery Co., Cleveland, was installed. This machine is mounted on tracks, 68 ft. center to center, and spans four tracks for unloading the ore into cars for transfer to the furnace. Ore storage of 100,000 tons capacity has been provided, but it is not necessary to carry such a large stock of ore, as boats can be unloaded at the dock the year around. No trouble was experienced during this winter from frozen ores as the Mediterranean ores are still warm when they arrive and other ores that are used, such as Swedish, are free from moisture and can be handled in any weather.

The new furnace and material-handling equipment has effected a great reduction in the labor required. With the old hand-filled furnace 180 men were used per 24 hr. to handle materials and fill the furnace, but since the new equipment has been in use 85 men suffice for such work.

As to coke supply, the furnace is practically self-sustained, being located adjacent to the by-product ovens of the Philadelphia Gas & Electric Co., no railroad transfer being required except switching within the yard. Due to the location of the furnace, it can obtain high and low volatile coal from Pennsylvania, or it is possible to bring lower ash and higher volatile coals from Virginia and West Virginia and discharge at the company's dock.

Originally built in 1881, the Delaware River furnace had for some years prior to and after the war been operated only intermittently. In 1922 the height of the stack was raised from 70 to 85 ft., a fourth stove was built and a single-strand pig casting machine was installed. The improvements started in 1924 and completed in 1925 included a new skip hoist to replace the old hand-filling method, a new stock trestle and storage bin system, scale car, skip bridge, hoisting engine and a new top structure with a McKee revolving distributer and electrically operated bell rigs of the Morrison type. This work was done by Arthur G. McKee & Co., blast furnace designers and engineers, Cleveland.

The new trestle, which is of steel construction, consists of 38 bents, a total length of approximately 720 ft., of which 185 ft. is utilized by the ore, coke and stone bins, the remainder of the trestle being available for storage purposes. Occupying three bents in the trestle immediately opposite the furnace is a coke bin of about 70 tons capacity, which discharges directly into skip cars over McKee Cascade coke screens. The coke bin is constructed of ⅝-in. steel plate properly re-



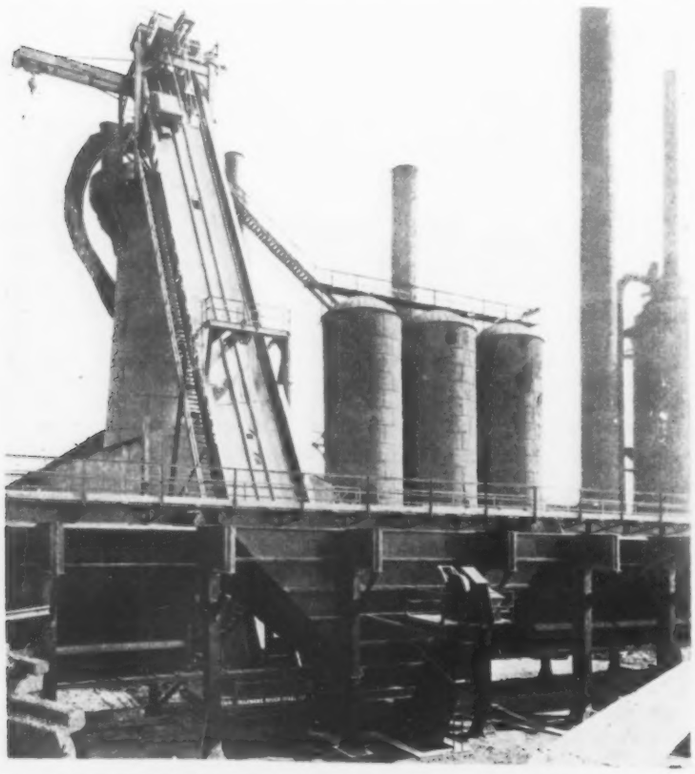
Electrically operated Morrison bell hoists were installed as a part of the new furnace equipment, showing some advantages over steam, air and oil operated bell rigs

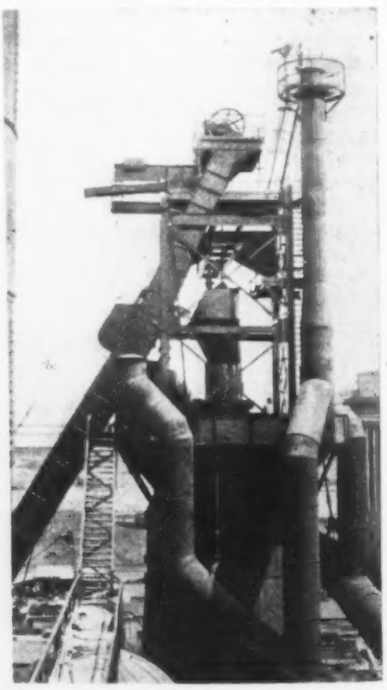
inforced and stiffened, and is provided with ⅜-in. wearing plates in the lower portion. The coke breeze is removed by the screens and passes into a hopper, from which it is discharged into the yard by means of a bucket elevator.

Ten ore and stone bins were installed, five on each side of the coke bin. Each bin has a capacity of 160 tons of ore and is constructed of ⅜-in. plate throughout. These bins are the latest improved design of the Baker suspension type and eliminate the use of diaphragm plates, which previously tended to retard the free flow of ore from the bin. Louvres are also provided to allow the scale car operator to poke the material in the event an extremely wet or sticky ore is being used. This improved design of bin insures ready discharge of the bin contents without any manual effort other than that of the scale car operator. The ore and stone bins are equipped with a continuous line of segmental type gates arranged for convenient operation from the scale car platform. The scale car has a capacity of 80 cu. ft. and is of heavy construction and equipped with a 25-hp. motor, standard scales with Miller type beam box, warning signal and other customary accessories.

The skip pit is constructed of reinforced concrete and lined with ⅜-in. tank to render it waterproof. A double-track skip bridge was installed, the bridge being of the deck type with shear leg support midway between the base and the top of the bridge. Two skip cars equipped with manganese steel wheels were provided for carrying the stock up the bridge into the furnace.

No changes were made in the old furnace shell and brickwork, these being in good condition. The old furnace top platform was also retained and sufficient reinforcing members were installed to support the new top equipment, which consists of a ¾-in. plate gas seal





The larger illustration shows the furnace, skip bridge, trestle, coal bin and coke breeze disposal equipment; new furnace top in close-up

with cast top and bottom flanges, a McKee revolving distributer, 20-ton trolley for handling the large bell and hopper, bell beams, bleeder, test rod mechanism, etc. The revolving distributer is of the latest type with worm and gear drive direct from the distributing motor, which is mounted on the spider supporting casting. The distributer control board is located in the hoist engine house, as are also the electrically operated bell rigs.

Bell Hoists of a Recent Type

Due to the necessity of conserving the available supply of steam, it was decided to install electric bell hoists of the Morrison type, a comparatively new device.

This type of hoist requires very little power and from its operation appears to have some advantages over steam, air and oil operated bell rigs. Both large and small bell hoists are identical with the exception that the worm and gear unit for the small bell hoist has a greater reduction than that for the large bell. The operating cable is attached through a spring barrel trunnion to the end of levers mounted on the large gear shaft. This spring is compressed when the bell is closed, and in operating the compression is relieved and the bell starts to open slowly, gradually increasing in speed until about half way open, when its speed decreases until the lowest open position is reached. The bell is closed with the same relative speed motion, a complete cycle of dumping and raising being accomplished without reversing the motor. The rigs are equipped with overload switches and emergency switch to stop the apparatus in case a large piece of scrap should become lodged between the bell and hopper.

With these improvements, the Delaware River Steel Co. expects to be able to keep its furnace in blast continuously, barring shut-downs for repairs or relining, and to meet all domestic and foreign competition. Last year more than 200,000 tons of the 441,000 tons of foreign pig iron brought to the United States, went up the Delaware River past the plant to docks at Philadelphia.

The trestle structure, bins and scale car underneath the bins

Teach the Foreman to Teach*

He Is the Key to Immense Potential Gains in Productive Efficiency But Must Be Carefully Handled

NOT more than two to five per cent of the personnel of any organization either desires, or is fitted for, any more than what may be termed job-training; i.e., instruction which may be expected to improve their worth on the particular jobs on which they are engaged. This fraction of two to five per cent is available for what may be called promotional training;—instruction with a view to improving their position in the organization.

Experience has shown that in the great majority of cases, it is useless to attempt promotional training through foremen. For this purpose the higher plant executives must be called upon, or some special form of outside training developed which will actually aid in the position just ahead. It may be mentioned that many of those who have enrolled in home-study, mail-order or night-school courses fail to correlate their study with their job-prospects so that it often happens that a period of five to ten years elapses between the time when the course is taken and the information is used. Advice from some executive regarding the type of course to be taken or else better judgment on the part of employees taking such courses is necessary if great waste is not to take place here.

Foreman's Help Needed, Nevertheless

WHILE the foreman is, usually, of little aid in training from the promotional standpoint, his aid is nevertheless necessary unless the whole program of training for advancement is to be nullified. For the foreman can, intentionally or otherwise, easily upset all such plans for educating the ambitious two to five per cent and can neutralize or nullify not only the effects of any educational measures but can actually discourage the employees available for promotion to such an extent that they must be classed with the 95 to 98 per cent. Talk frankly to the foreman. Explain what is being done and why it must be done. Ask him to keep an eye on the youngsters whose promotion is a matter of so much concern to the organization. By securing his good-will it is possible to keep track of their progress in a manner which would otherwise be impossible.

So far as the 95 to 98 per cent of the employees is concerned, the bulk of the job-training must be left to the foreman. It is to his interest, as well as to the firm's, that the skill of each particular worker be developed as much as possible. Foremen readily recognize this, for the most part, but seldom know just how to go about training in any systematic way. Most foremen have certain instructional ideas, which have been worked out with regard to certain individuals . . . these are not always adaptable to an entire organization.

What can be done to teach the foreman to teach his men? First of all, get them together in regular foremen's conferences. Have some one tell them just what is desired in the way of job-upgrading or increase in job-efficiency. Ask for suggestions in regard to education. As soon as an individual has made a few suggestions, he feels identified with the campaign and will then assume his share of the responsibility.

Many large companies have formed foremen's clubs, chiefly for the purpose of stimulating a program of foreman-education for the least efficient workers in the shop. Sometimes cooperation with trade schools or university extension courses is possible. But most of the real work must be done in the shop by the foreman, who alone can keep an eye on the progress of each employee and report to the individual in charge of the program.

*Abstracted from a paper presented to the convention of the American Management Association by Frank Cushman, chief Industrial Education Service, Federal Board for Vocational Education, New York, March 3.

Stocks of bituminous coal in the hands of consumers Feb. 1 were approximately 45,000,000 net tons, according to a report of the United States Bureau of Mines. This is a drop from the 49,000,000 tons of Jan. 1, but is about in line with the figure of one year ago.

Automatic Lathe for Large Output

Heavy-Duty Unit Believed to Offer New Possibilities for Machining Cluster Gears and Other Parts—Versatility a Feature

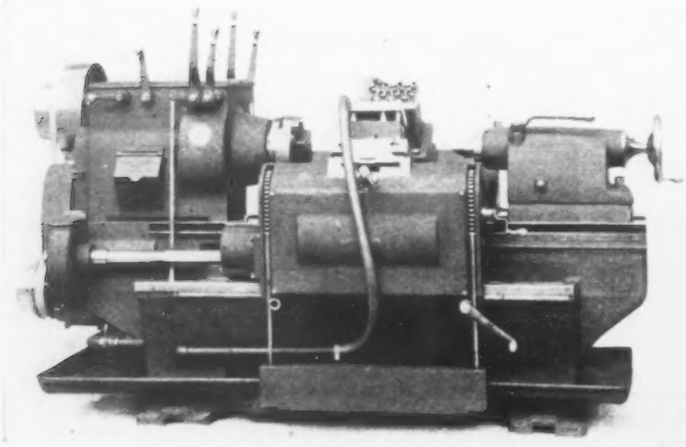
UNUSUALLY high production in the machining of cluster gears, wheel hubs, sleeves, housings, shafts and similar parts is claimed for the heavy-duty automatic lathe here illustrated, which is being placed on the market by the R. K. LeBlond Machine Tool Co., Cincinnati.

The machine, designated as the No. 16, is intended to supplement the company's line of Multi-Cut lathes, with a capacity for larger and heavier work and increased production possibilities. The universal features and general versatility are stressed as making possible an efficient tooling arrangement, and the power and rigidity as permitting unusually heavy cuts to be taken without vibration and strain.

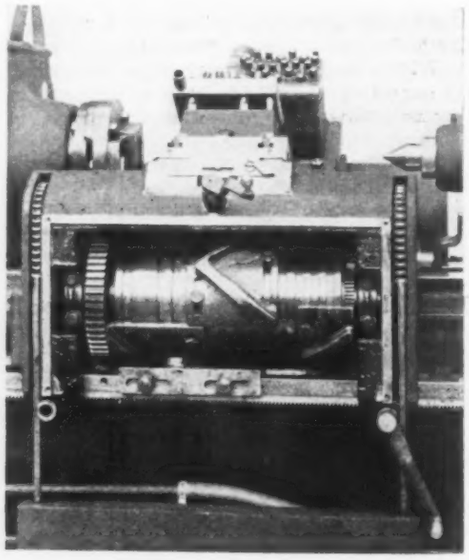
This machine is provided with front and rear carriages, each traveling on separate shears, the bed being of the double-shear type. These carriages embody a cam drum having a simple system of cams for actuating them in their respective travels. Both front and rear carriages provide a longitudinal movement for turning cuts and a cross movement to the tool slides for facing cuts and these travels can be arranged independently or in combination. Rapid power traverse to the carriages and cross slides is regularly furnished.

Operation is entirely automatic, the operator being required merely to insert the work and engage the feed lever. The carriages are advanced to their starting positions rapidly by power traverse and the feed is then engaged automatically. The carriages and tool slides feed along until their respective operations are completed, when the feed is tripped, the spindle stopped in a predetermined position and the flow of cutting lubricant shut off—all automatically. The power traverse is then engaged automatically and returns the carriage and tool slides to their starting positions. Additional carriages can be furnished on long bed machines. One operator can handle from three to four machines.

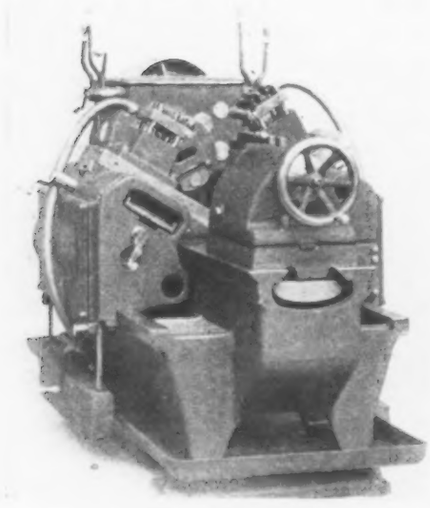
The lathe is essentially a heavy-duty machine of



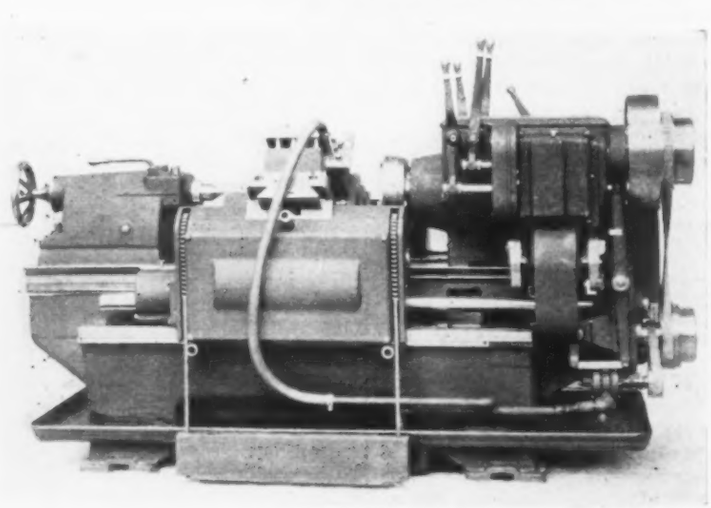
Front View of New LeBlond Heavy-Duty Automatic Lathe. The machine is of massive proportions and is designed to permit efficient tooling for a variety of work



Cam Drum Mechanism For Actuating Carriage and Cross Slide



View Showing Double Shear Bed Construction



Duplicate Sets of Control Levers Permit Operation From Either Front or Rear

massive proportions and large bearing surfaces. The headstock is of selective-speed type providing a range of nine spindle speeds obtainable by manipulating two change levers. The bed is well braced by cross girths, and is made in several lengths to provide the required distance between centers.

Efficient Tooling Made Possible

The tooling possibilities are said to be practically unlimited. It is claimed that since either turning or facing cuts or a combination of both can be taken with both front and rear carriages and in either direction, a highly efficient tooling arrangement and machining method is possible, resulting in a reduction in machining time.

The headstock drive is through an unusually large pulley with a high-speed belt. The driving pulley runs on an oil bush to relieve the drive shaft of the belt pull, and is clutched to the shaft by a multiple-disk, driving clutch running continuously in oil. The friction itself is made up of interspaced molded Raybestos and ground steel plates, the effective friction surface area being very large. Within the friction itself are three heavy coiled springs which serve to separate the plates while the friction is disengaged, and in addition, apply a large cone friction brake immediately upon release of the friction, bringing the spindle to an instant stop. Flooded lubrication is employed, the headstock being filled with oil to a level indicated on the front. By a submerged geared pump and a system of piping, oil is brought to every bearing and flows over the entire gear train.

The gears in the headstock are of chrome-nickel steel, heat-treated and hardened. They have stub form teeth to increase their strength and are rounded to insure easy sliding engagement. The sliding gears are mounted on short high-carbon shafts with six accurately hobbed splines, the corresponding keys in the gear being broached from the solid. The spindle is large and is made of high-carbon crucible steel forging. The spindle boxes are tapered, bronze babbitt lined, and are adjustable. The spindle nose is a heavy large diameter flange for the application of drivers and fixtures.

The bed, of double-shear type, has a pair of wide dovetail guiding shears on which the headstock and tailstock are mounted. These shears also support and guide the front and rear carriages, which in addition take a bearing on the outer pair of broad flat shears. All bearing surfaces are provided with adjustable gibs for taking up wear. The bed is made of semi-steel casting. The tailstock is screw-operated and is of the set-over type. It has a long bearing on the shears of the bed and is clamped in position by four large bolts. The tailstock spindle is of high-carbon steel and is of large diameter.

Cam Mechanism Controls Travels of Carriages and Cross Slides

The front and rear carriages of the machine incorporate a cam drum and a simple system of cams for actuating them in their respective travels, the longitudinal movements of the carriages and the cross movements of the facing slides being derived from these cams. The cams are adjustable in position and in designing the cam mechanism special attention is said to have been given to keeping the set-up time at a minimum. As previously mentioned, the travels of the carriages and cross slides can be in either direction and in any necessary combination, this versatility being stressed as offering unlimited tooling possibilities. The tooling arrangement can therefore be the most efficient for the particular part which the machine is to handle. The drive to the cam drums is through spur gears from a multiple-splined feed shaft at the front and rear of the bed. The drive to these feed shafts is from the headstock spindle through gearing on the end of the head. This drive is simple and powerful and includes a change gear reduction for varying the rate of movement of the cam drums. The machine is regularly furnished either with a standard set of cams for plain turning and facing work or with a set of special cams designed to suit individual requirements.

The carriages are kept in alinement by adjustable gibs, which are conveniently located. The cross slides are mounted in wide dovetail slides with taper gibs for adjustment. The carriages and cross slides are provided with rack and pinion movements for hand adjustment during the set up, and a crank is also provided for revolving the cam drums by hand while adjusting the cams in position. The facing slides are assisted in their return travels by a suspended counterbalance weight.

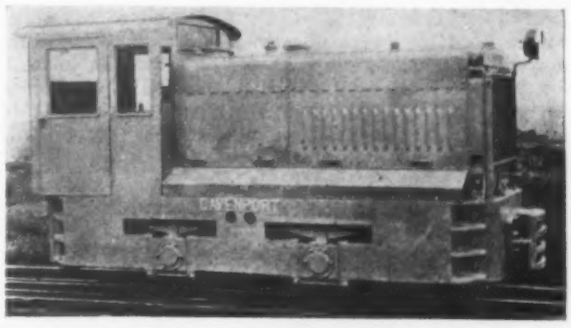
The machine is of universal design, the front and rear carriages, cam mechanisms and slides being identical. It may be operated from either front or rear and duplicate sets of control levers are provided. The short lever simply controls the multiple disk clutch in the driving pulley, although an automatic spindle start and stop is provided in addition which is engaged automatically by the long lever. This long lever also engages the feed and traverse for the carriages and cross slides through the cam mechanisms.

The cross slides are arranged to receive special tool blocks or the company's multiple-tool blocks can be furnished. For plain taper turning a taper attachment is available for either front or rear carriages. The tape attachment mechanism is built in the carriage housing and consists essentially of a guide bar, and follower rollers. The guide is adjustable to any desired taper and can be replaced by special form plates for duplicating work of irregular contour. The longitudinal movement of the carriages while taper turning is derived from the cam mechanism.

A constant-speed geared motor drive arrangement is available, the motor being mounted on top of the headstock. The drive is through the motor pinion and a Micarta intermediate gear to the broad-faced gear that replaces the driving pulley. In addition to being compact this drive arrangement is stressed as being well balanced and as minimizing vibration and noise. The entire drive is inclosed by a cast iron gear guard.

New Line of Gear Drive Gasoline Locomotives

A new line of gasoline locomotives of the gear drive type, ranging in size from 8 to 20 tons, has been placed on the market by the Davenport Locomotive Works, Davenport, Iowa. In these locomotives geared transmission replaces the roller chain transmission and individual wheel drive of the company's present gasoline



Geared Transmission Replaces Roller Chains

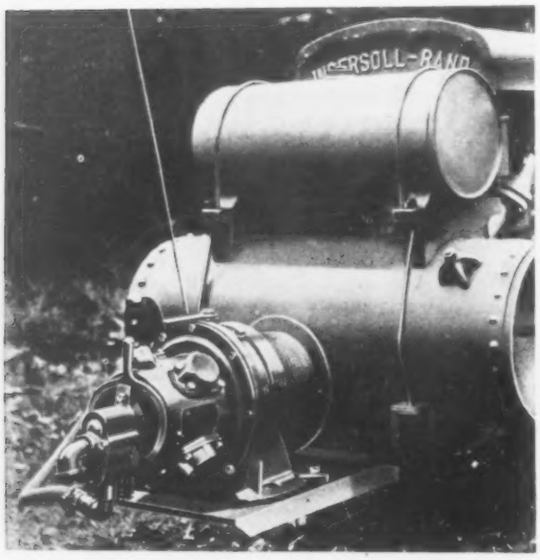
locomotives, although the manufacture of the original type will also be continued. Three-point suspension principle with cross equalizer to give improved tracking qualities has been incorporated, and semi-elliptic springs have been employed in order to obtain wider distribution of stresses and better dampening of shock. The cab, which is of steel, is fully inclosed and roomy to permit of comfortable and convenient operation.

Simplicity, strength and accessibility of parts for quick adjustment and repair are general features claimed. Among mechanical features stressed is the master clutch of step-jaw type, which is always halfway in when the faces are engaged, thus eliminating the possibility of chipped corners on the clutch faces. This construction is said to permit reduced clearance

which reduces backlash. Both the engine and the transmission have individual force feed lubrication systems, with pressure gages in the cab. Alemite fittings are provided for the journals at the driving wheel. Climax engines are employed—six cylinders in the 16- and 20-ton locomotives and four in the 8- and 12-ton machines—with four speeds forward and four reverse. Both speed and direction selection clutches slide on splined shafts for accurate, positive engagement and lock automatically in position.

Air Hoist for Use with Portable Air Compressors

A recent addition to the line of the Ingersoll-Rand Co., 11 Broadway, New York, is the DU "Utility" air motor hoist, here illustrated, which is intended for use with portable compressors. The machine may be employed in a wide variety of pulling and hoisting jobs,



The Hoist Is of Winch Type and Is Mounted on the End or Side of the Compressor

including the hoisting of such building material as steel members.

The hoist is of the winch type and is light and compact. It is provided with mountings by which it may be attached to the rear end of a 5 x 5½ in. or a 5 x 5 in. portable compressor, to the side of the larger compressors, or to compressors mounted on Ford trucks. It is capable of exerting a rope pull of 1000 lb. and it takes 350 ft. of 5/16-in. cable. A swivel bolt is provided in the bottom of the base to permit the hoist to be swung around into any desired position. The machine is equipped with a clutch so that the cable can be played out by hand or by a down-grade load without turning over the motor and consuming air. A hand brake on the drum permits quickly checking the unwinding. The throttle control is of a sturdy design, and is claimed to be so sensitive that although carrying full load of 1000 lb. at 80 lb. air pressure, any speed of rope travel from a slight movement up to a maximum speed of 65 ft. per min. may be obtained.

The hoist is 15 in. wide, 25⅜ in. long and 19⅛ in. high. The weight is 250 lb. net. A winch head can be furnished in place of the rope drum.

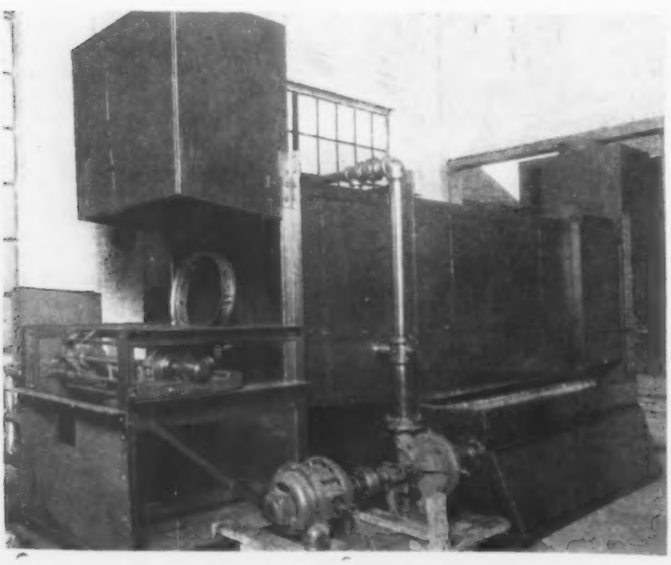
Malleable Castings by a Duplexing Process

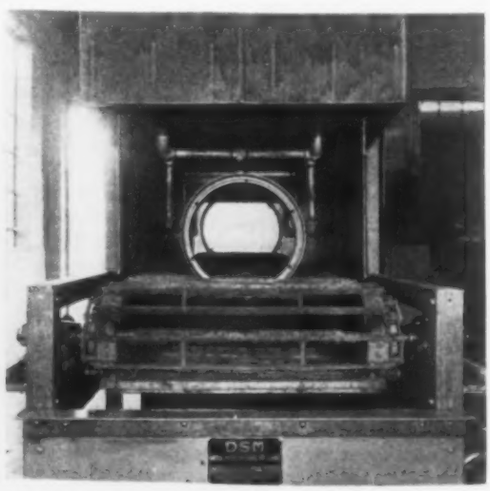
A duplex process for the manufacture of malleable castings has been placed in operation in the malleable foundry of the Saginaw Products Co., Saginaw, Mich., a subsidiary of the General Motors Corporation. Iron is melted in a 90-in. cupola, lined down to 64 in., and transferred in a ladle to a 3-ton Pittsburgh electric furnace, where it is brought up to pouring temperature, being kept in the furnace about 15 min. The first castings were made under the new process late in February, and production has been gradually increased. Results so far indicate the success of the process and some of the air furnaces that have been used in this foundry are now being removed.

Machine for Washing Metal Parts

A washing machine for cleaning metal parts has been brought out by the Detroit Sheet Metal Works, 1340 Milwaukee Avenue, Detroit. Water heated with steam to a temperature of 200 deg. Fahr. in the tank beneath the machine is drawn through a fine mesh screen into a separate compartment in the tank and from there a motor-driven suction pump forces it under pressure through a spray manifold which throws the water against the work at high velocity. It is stated that the water strikes the work with sufficient impact to get under and loosen the grease on the work, so that less washing compound is used to remove it than would otherwise be required.

The chains of the conveyor that carry the work through the machine ride on track angles and flight bars spanned between the two lines of chains, so that the chains do not drag, either when the work is moving through the machine or on the return travel. The conveyor is driven by motor and chain, the motor being located on the top of the casing. The conveyor itself has only four bearings. The machine illustrated is 14 ft. long and 3½ ft. wide.





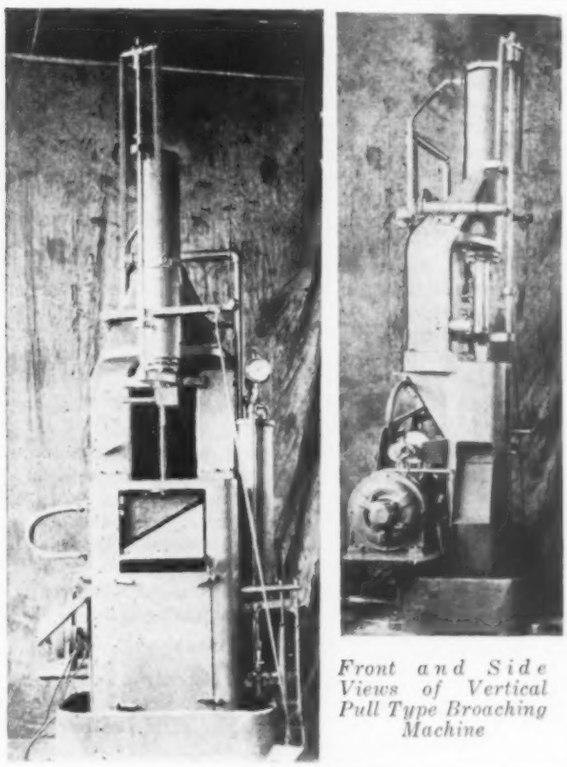
Water Under Pressure Is Thrown Against the Metal Parts. The work is carried on the chain conveyor

Vertical Hydraulic Pull Type Broaching Machine

A vertical hydraulic broaching machine of the pull type, intended for sizing round holes, sizing spline holes and broaching of hexagon, serrated and holes of other shapes, has been added to the line of the American Broach & Machine Co., Ann Arbor, Mich. The machine is of 8-ton capacity, and is designed to take broaches up to 18 in. in length.

The construction of the machine may be noted from the accompanying illustrations. The front view shows the machine after the broach has been pulled through the work and the work has been discharged into the side chute. The broaching tool then automatically returns to the starting position. In the latter position the shank end of the broach projects through the angular table and the machine is ready to receive the work.

After dropping the work over the shank of the broach, the operator touches the outer foot pedal at his right, which causes the lower cylinder to push the broach up until it connects automatically with the pull head. The operator then presses a second foot pedal which starts the pulling ram on its upward movement. The broach continues to travel upward until a certain point is reached, when the work drops to the angular table and slides down the chute at the left-hand side of the machine. The cycle of operation is said to be made in approximately 8 sec.



Front and Side Views of Vertical Pull Type Broaching Machine

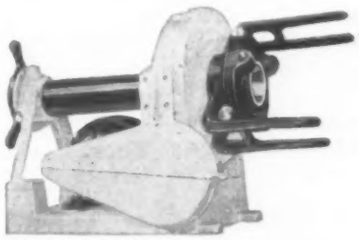
A knock-off stop trips the controlling lever, causing the machine to start on its return stroke. When the head has reached a point about 5 in. from the bottom stroke, it is released automatically by means of a latch attached to the left-hand vertical member of the frame. The broach then drops, passing through a soft metal guide in the angular table and into a soft metal bushing in the upper end of the lower cylinder, and strikes a soft metal disk. This process is intended to clean all the chips from the broach.

The machine is equipped with a pump for cutting lubricant, which supplies a flood of oil just underneath the angular table. The hydraulic pump is of full-flow twin-screw constant-pressure type. A direct-reading pressure gage, graduated in pounds and tons, is part of the equipment as is also a relief valve which can be set for various pressures.

Portable Power Drive for Pipe Tools

Light weight and compactness are features of a new power drive for pipe tools which has been added to the line of the Oster Mfg. Co., Cleveland. The new machine weighs only 150 lb. and is portable as a unit, without removing any parts.

The body of the machine is for the most part of an aluminum alloy which is not only lighter in weight but is also stronger and more durable than the cast iron model formerly offered by the company. The drive is by means of a ½-hp. universal, reversing motor which automatically speeds up on the smaller sizes of pipe and holds the necessary speed on the larger sizes. The motor can be operated from a 110 or 115-volt lighting circuit, either direct or alternating current.

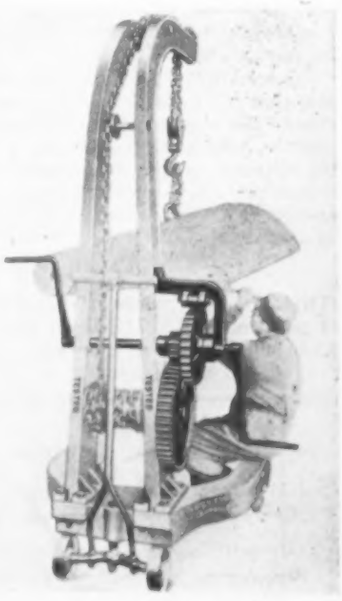


The Body Is of Aluminum and the Device Is Portable as a Unit

The machine is designed to drive die stocks and pipe cutters up to 2 in. capacity, but with an auxiliary drive shaft, which can also be furnished, geared die stocks and cutters up to 6 in. capacity can be driven. In addition to this the machine can be used to screw up fittings, as a pipe wrench can be held in its driving arms and revolved. The pipe is held stationary in a three-jawed, self-centering chuck and the pipe tools are turned by means of the driving arms. Self-centering universal guides are provided at the rear of the machine to facilitate centering long lengths of pipe. The machine is 18⅛ in. high, 14½ in. wide and 30 1/6 in. long.

Portable Crane with Safety Load Brake

A safety friction load brake for use on its portable cranes has been placed on the market by the Canton Foundry & Machine Co., Canton, Ohio. The device has been designed not only for incorporation on new machines, but for installation also on machines now in service. In holding the load at any point and in eliminating the chance of the load getting away from the operator, the load brake is claimed to assure positive safety to the operator and to the work being handled. It complies with the safety laws of those States which require load brakes on this class of equipment.



The device, for which patent has been applied, operates by means of friction disks in connection with a helix. It is designed so that the pawl is always engaged in the ratchet and it is necessary to wind the load down as well as to raise it. Thus, whether or not the operator of the crane lets go of the handle, the load cannot get away from him.

Business Analysis and Forecast

BY DR. LEWIS H. HANEY

DIRECTOR, NEW YORK UNIVERSITY BUREAU OF BUSINESS RESEARCH

Current Statistical Data, Considered Independently of Trade Opinion, Indicate That:

THE moderate recession in the adjusted index of steel ingot production will tend to steady prices.

If the March ingot output does not increase more than 12 per cent, the usual seasonal gain, over February, the market should not weaken greatly.

Pig iron output is now more in balance with steel production and nearer normal requirements than was the case a month ago.

Some further decline in the pig iron market seems likely, in view of output above normal, weak coke markets and declining trend of steel production.

Recent advances in the scrap market do not seem likely to be sustained.

FEBRUARY data indicate a moderate recession in the steel industry which somewhat resembles that which occurred about a year ago.

The statistical position of the industry is illustrated in Fig. 1. Here it appears that all of the curves are on the downgrade. On the basis of the averages for the month, declines were registered in ingot production, in unfilled orders, and in the average price of finished steel. Moreover the indexes are all lower than a year ago—notably so in the case of unfilled orders and prices.

The actual number of tons of steel ingots produced in February this year was larger than in 1925, the average daily output being 158,131 tons against 156,510 tons last year. The difference between the two figures, however, is less than would be accounted for by the normal growth of the industry and accordingly our adjusted figure covering the total output for the month shows a decline of 0.9 per cent between the two Februarys. Compared with January, also, there was a decline which was more than the usual seasonal variation and it is estimated that the ingot output in February was 109 per cent of normal requirements compared with 116 per cent in January.

An outstanding point is that the adjusted index of ingot production declined both in January and February, while in 1924 there were sharp gains in both months and in 1925 the February decline merely offset an increase in January.

A survey of the situation shows that production, allowing for seasonal variation, has been relatively steady for over a year. During that period it has remained somewhat above the normal requirements of the country; but, as consumption has on the whole been somewhat above normal, steel prices have held fairly steady at a level which is only a little lower than that of a year ago.

Unfilled Orders Down

THE unfilled orders of the United States Steel Corporation at 4,617,000 tons are considerably below the 5,285,000 tons of a year ago. It does not now seem probable that the unfilled orders curve will continue to decline so long as was the case last year.

The cold fact, however, is that the trend of unfilled orders has been downward thus far this year and it is true that prices rarely turn up when the unfilled orders curve is headed down. The February average of THE IRON AGE index of finished steel shows a slight recession, which is as forecast. The February average was 2.428c. against 2.448c. in January. Recently the price index shows a slight recovery. Statistical indications are that this will not be maintained: the general commodity price level is declining; unfilled orders are off; and ingot production is above normal.

Moreover, the upward trend of imports of finished steel along the Atlantic and Gulf coasts is tending to hold prices down, particularly in the case of steel bars, wire and various small shapes.

Much depends on the course taken by the manufacturers in their production schedules. The reports of increased production activity thus far in March do not suggest any recovery in steel prices. It should be remembered, however, that March production is normally about 12 per cent greater than February and if the ingot output does not gain by that amount it is probable that the steel market will hold fairly steady.

Pig Iron Still Weak

AN examination of the statistical position of pig iron strongly indicates a downward readjustment. Prices have undoubtedly weakened in spite of the rather hasty right-about-face in production which occurred in February. The February output of pig iron averaged 104,408 tons per day against 106,974 tons in January and 114,791 tons in February, 1925. The total for the month declined more than usual, which fact brought our adjusted index down to 111 per cent of normal requirements against 121 per cent in January. This represents a material decline from a year ago. The fact remains, however, that pig iron output is running considerably above the estimated normal requirements of the country, based on the trend line of past years.

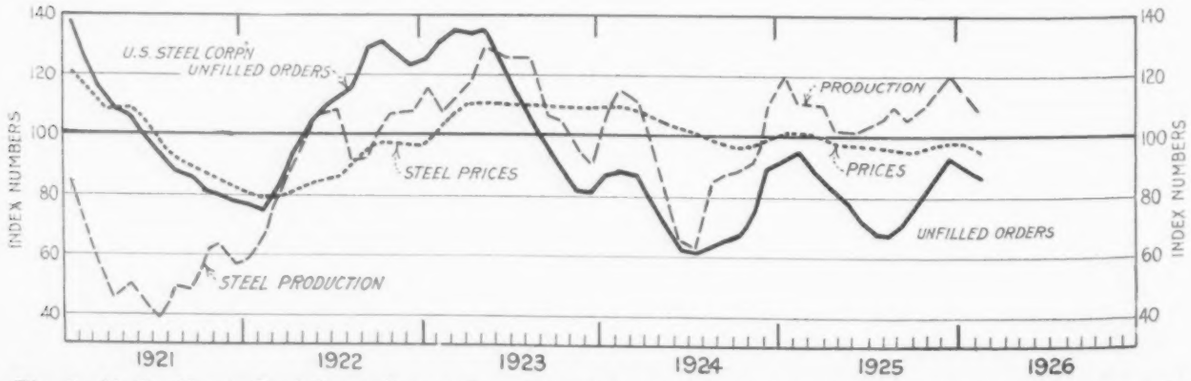


Fig. 1—If the March Steel Ingot Output Does Not Show an Increase of More Than 12 Per Cent Against February, the Usual Seasonal Increase, the Market Should Not Weaken Greatly

In This Issue

Standard practice for molding can be profitably used in jobbing foundry.—Building of flask equipment for large castings and development of written standard-practice methods sometimes save as much as 50 per cent of molding cost.—Page 753.

High-grade cast iron said to have been produced in Germany from poor quality scrap by duplexing.—Superheating liquid iron (from 1500 to 1700 deg. C.) produces unusual properties, is claim.—Page 760.

Some further decline in the pig iron market seems likely, says Dr. Haney.—Pig iron output estimated at 11 per cent above normal; steel production 9 per cent above normal; with coke at $3 and buyers holding off, some weakness regarded probable.—Page 776.

Ordinary steel angles used in new system of steel frame house construction.—Interchangeable units can be manufactured in quantity and bolted together on job.—Page 767.

Special erecting bed designed for handling 60-ton castings in power-plant machine shop.—Located on standard gage track, under shop crane, and equipped with portable head stock, tail stock and tool head.—Page 757.

Eastern blast furnace combats imported iron with new, low-cost equipment.—Plant capacity practically doubled by three-year improvement program of Delaware River Steel Co., Chester, Pa.—Page 769.

Foreign foundry iron can be brought to Boston for $7.70 a ton less than domestic product.—Indian iron can be landed in Philadelphia $6.41 a ton below domestic pig iron; Tariff Commission finds it costs but $3 a ton to ship iron from Europe to Atlantic seaboard, $4 to Pacific; $5 a ton from Calcutta to Atlantic ports.—Page 780.

If material for houses can be fabricated in shop instead of fitted on the job, large scale production methods can be used.—Material can be produced for stock, eliminating much seasonal unemployment; steel would permit this.—Page 766.

Continuous pusher-type electric heat-treating furnaces each save four men and reduce stock carried one-third.—Counter-flow type furnaces recently installed at Hudson Motor Car Co., Detroit.—Page 764.

Hardness and strength of cast iron not reflected in wear or machineability.—These qualities are dependent on structural forms of carbon in the iron, says E. J. Lowry, Hickman, Williams & Co.—Page 789.

Solution of aqua regia in glycerine proves remarkable etching reagent for iron-chromium alloys.—Special polishing method used with this reagent produces unusually fine photomicrographs.—Page 761.

Estimates life of crane cables on a tonnage-handled basis.—Usual custom is to change after six months service or first broken strand; new plan said to work out better.—Page 768.

No excessive tariffs bar Europe from selling steel here.—Boston & Maine's recent purchase of 15,000 tons of German rails an example; railroad freights hold imports at present level.—Page 786.

More statistical information concerning steel consumers needed.—Such figures are actually more barometrical than steel tonnage itself, because demand comes before tonnage.—Page 786.

Stock market reaction has not uncovered any fundamental weakness in business structure as yet.—Overactivity of pools now being compensated; business still sound.—Page 787.

Business News in a nutshell.—Corporation's unfilled orders drop 265,917 tons from Jan. 31, now 4,616,822 tons; Interstate Commerce Commission refuses to permit transcontinental roads to reduce rates on iron and steel products to Pacific Coast, plea was for reduction of 80c. to $1 a ton (generally), water route from Pittsburgh via Baltimore still cheapest; Tariff Commission to hear petitioners on increased pig iron duty April 20.

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Technical, Commercial and Economic Contributions

NOT always does it happen that several technical contributions of outstanding importance all fall into a given issue. It is, however, the case this week.

To the large and growing group of investigators into the structure of metal the account elsewhere of an etching medium and method calculated to open up undiscovered fields is of substantially epoch-making character. Almost revolutionary is the finding of another author that fracture tests of pig iron, of recent years regarded as beneath scientific consideration, are of more value than chemical analyses, and that machineability and wear of a casting are not dependent on the hardness of the iron.

Of commercial and economic importance is this week's installment on "The Dwellings of Tomorrow," with its showing of the practical use of light angles fabricated into standardized frames for assembly into a building frame. There is also the record of the development of an automatic lathe of wide adaptability for heavy duty work and large output.

For News Summary See Reverse Side

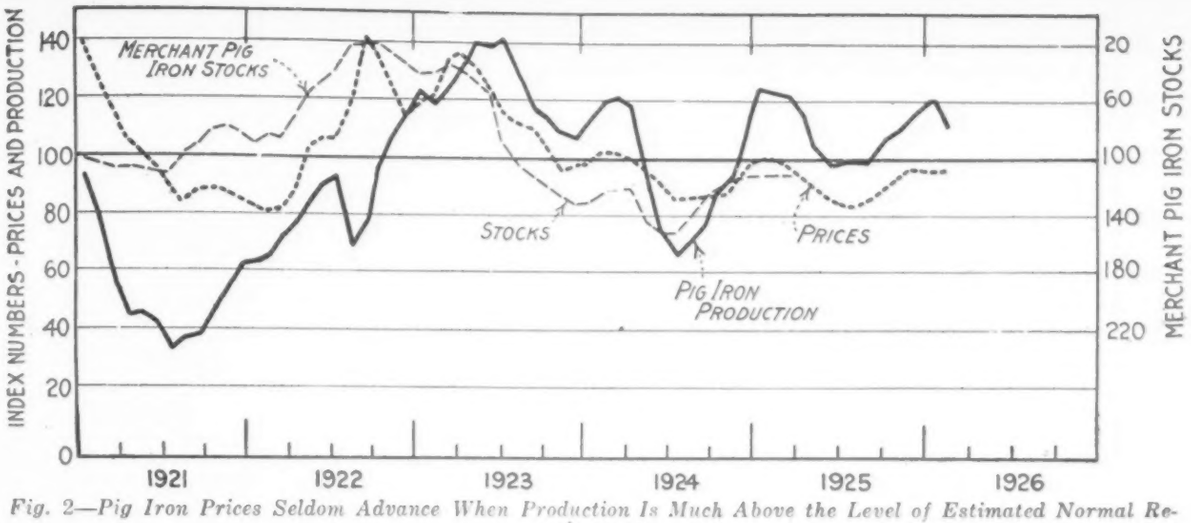


Fig. 2—Pig Iron Prices Seldom Advance When Production Is Much Above the Level of Estimated Normal Requirements

A notable development of a favorable character is the return to a closer adjustment between the pig iron output and steel ingot production. The upward and downward swings of pig iron production are considerably wider than those which occur in steel. Generally, when the pig iron curve swings down after having been higher than steel, and crosses the steel curve on the decline, improvement is near. The relatively sharp decline in the production in pig iron in February, therefore, is favorable and if continued it should mean that an important readjustment will have been effected in another month or two. It would tend to cause firmer pig iron markets shortly thereafter.

At present, however, the pig iron markets are on the whole weak and are likely to continue so until the readjustment referred to has been completed. THE IRON AGE average for February was $21.52 against $21.54 in January. Moreover, on March 9 there was a further decline to $21.38.

It should be noted that the second chart shows that at no time does pig iron advance in price when the production is much above the estimated normal requirements. No sustained advance in pig iron can be expected until further curtailment in output is shown, making due allowance for seasonal conditions.

Foreign pig iron, largely German, continues to make some headway in the Eastern markets and reports indicate that the number of those who are using such iron is increasing. The coke boom is over and more domestic furnaces are apparently producing iron. The present price of pig iron is out of line with the price of both semi-finished and finished steel.

Some Readjustments Needed

A STUDY of the price chart (Fig. 3) which has been brought down through February makes the definite impression that there is steadiness in the middle of the structure and weakness at both ends.

In the middle, we find billets and bars practically unchanged for over four months.

On the other hand, we find weakness at the bottom of the list. Spot foundry coke has fallen back to $3 and pig iron is gradually sagging. At the top we find that sheets have lost part of their year-end advance and in spite of some recovery in demand, concessions are still reported.

With coke at $3 and pig iron buyers holding aloof, it seems that iron prices are due to fall.

Local advances in the scrap market do not seem likely to be sustained, as the supply is large and higher prices would be abnormal in comparison with iron and steel products.

The schedule of the next installments of Dr. Haney's analyses follows: March 25—General business outlook; April 8—Status of steel consumer demand.

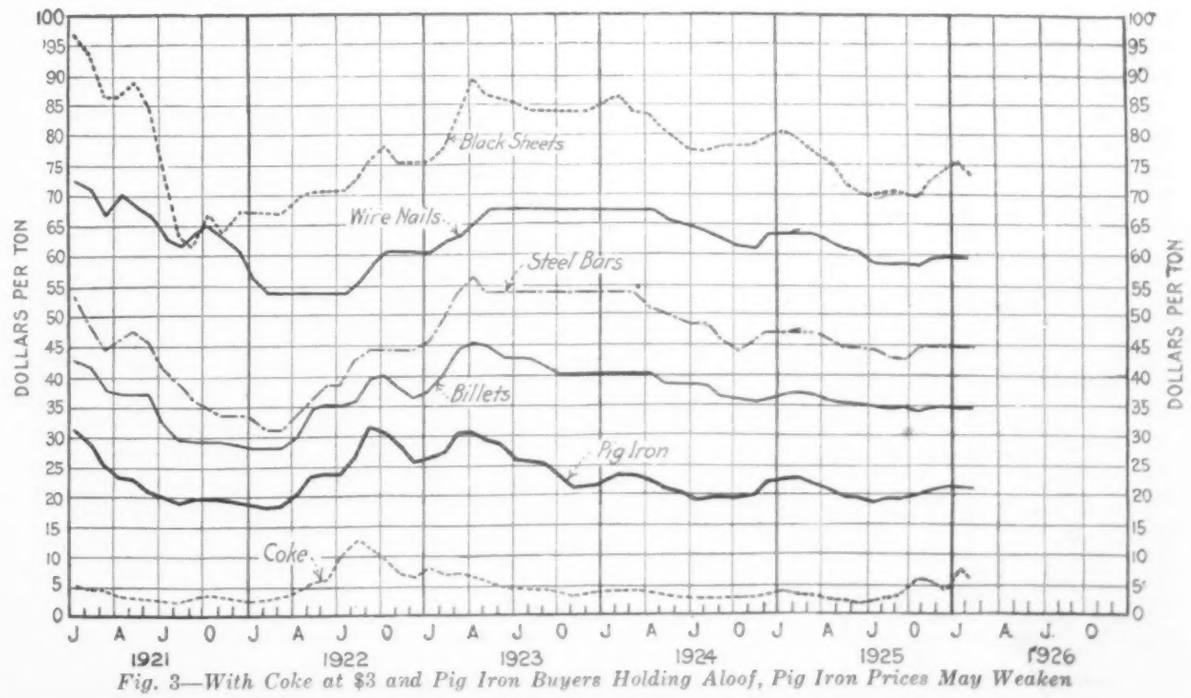


Fig. 3—With Coke at $3 and Pig Iron Buyers Holding Aloof, Pig Iron Prices May Weaken

Foreign Iron Costs $7.70 Under Ours

Difference at Boston Between Continental Foundry Iron and That from Buffalo—Tariff Commission Analyzes Costs

WASHINGTON, March 15.—The Tariff Commission last Saturday made public its report based on applications from the Eastern Association of Pig Iron Manufacturers requesting an increase of 50 per cent under the flexible provision (Section 315) of the Fordney-McCumber law in the present duty of 75c. per gross ton on pig iron. A public hearing on the complaint will be held in Washington beginning at 10 a. m., April 20, when both domestic producers of iron, including merchant furnace interests along the Atlantic seaboard, and importers will submit evidence.

Problems for particular discussion at the hearing are incorporated in the report. They relate to questions of different chemical analyses of competitive foreign and domestic foundry irons; whether or not any particular kind of foreign iron displaces any particular kind of domestic iron; fixed differentials for high silicon content for imported iron, the matter of making comparisons as to costs, and whether or not the year 1924 is representative.

Comparison of Cost of Production of Foreign and Domestic Basic Iron, 1924

(Per Gross Ton)

Item	Domestic Iron: Eastern District	Domestic Iron: Western District	Domestic Iron: Buffalo District	Domestic Iron: Alabama District	Foreign Iron: British India Iron
Costs, transportation not included: F.o.b. plant	$20.73	$21.67	$19.68	$13.20	$12.51
Cost or price, transportation included: F.o.b. plant	20.73	21.67	19.68	13.20	12.51
Transportation and other charges* to Philadelphia	†1.25	5.63	4.91	6.01	6.66
Total cost delivered in Philadelphia	21.98	27.30	24.59	19.21	19.17

Domestic costs are from producers' books and foreign costs, for the purpose of this investigation, are taken as indicated by invoice prices.

*Other charges include consular fee, brokerage, transshipment and insurance.

†Average: rates range from 76c. to $1.39.

*Comparison of Cost of Production of Foreign and Domestic Foundry and Malleable Iron, 1924**

(Per Gross Ton)

Item	Domestic Iron: Eastern District	Domestic Iron: Buffalo District	Domestic Iron: Alabama District	Foreign Iron: British India	Foreign Iron: Great Britain	Foreign Iron: Continental Countries†
Costs, transportation not included: F.o.b. plant	$25.17	$22.17	$19.39	$13.36	[a]$18.66	$15.29
Cost or price, transportation included: F.o.b. plant	25.17	22.17	19.39	13.36	18.66	15.29
Transportation and other charges‡ to Phila.	[b]1.25	....	6.01	6.65	3.52	4.09
Boston	....	4.91	....	6.65	3.52	4.09
Total cost delivered in Phila.	26.42	....	25.40	20.01	22.18	19.38
Boston	....	27.08	....	20.01	22.18	19.38

*Domestic costs are from producers' books and foreign costs, for the purpose of this investigation, are taken as indicated by invoice prices.

†Includes the costs for plants located in Germany, France, Belgium and Luxemburg.

[a] Approximate figure: from price f.o.b. foreign port 90c. has been deducted to cover inland freight.

‡Other charges include consular fee, brokerage, transshipment and insurance.

[b] Average: rates range from 76c. to $1.39.

The application of the eastern merchant furnace interests, made to the Commission on Dec. 7, 1922, was followed by another on Sept. 22, 1924. The investigation was instituted by the Commission on March 27, 1923, and, after a preliminary survey of the domestic industry in April, cost schedules were prepared and field work was begun in July, ran through August, 1923, and was continued in April, May, and June of 1925. The figures presented cover those periods.

Getting at the Foreign Costs

Cost data were not obtained from foreign producers of pig iron, but a study was made of invoices of approximately 80 per cent of all imports entered at the ports of Boston, New York and Philadelphia during the period Jan. 1, 1922 to Nov. 30, 1925. Many of the invoices failed to specify the kind of pig iron, the report states, and others did not include prices in sufficient detail. The final tabulation includes only invoices containing definite reliable information. It is asserted the invoices contained sufficient information in respect to inland transportation, consular fees, ocean freight and insurance to permit the determination of unit charges for these items.

In the domestic inquiry cost data were obtained for foundry, malleable, basic, Bessemer and low-phosphorus pig iron. As it was not possible to segregate the cost of foundry and malleable iron, the combined costs of the two kinds are given in the report. No cost data were obtained for charcoal, forge or silvery iron, as none of these appear to be imported. The domestic cost investigation embraced plants in the Buffalo, Eastern, Virginia, Alabama and Western districts. The Western district includes the territory between the Allegheny mountains and the Mississippi River and north of the Ohio River. Data were obtained from large and small, old as well as modern plants, and both the integrated (steel works) and merchant furnaces.

On the basis of rated capacity, cost data were ob-

Foreign Inland Charges, Ocean Freight and Insurance, and Weighted Average Prices of Imported Pig Iron at Foreign Plants, Foreign Ports of Shipment, and c.i.f. Port of Importation into the United States

(Per Gross Ton)

Country and Year	Price, f.o.b. Foreign Plant	Foreign Inland Charges	Price, f.o.b. Foreign Port	Ocean Freight and Insurance	Price, c.i.f. Domestic Port, Ex-duty
Foundry Iron					
Continental Europe:*					
1922	$18.89	$0.88	$19.77	$3.15	$22.92
1923	19.60	0.71	20.31	3.10	23.41
1924	....	....	13.80	†3.24	17.04
1925	15.29	0.92	16.21	3.17	19.38
British India:					
1923	....	....	....	....	26.93
1924	13.36	1.62	14.98	5.03	20.01
1925	....	....	16.82	5.24	22.06
Great Britain:					
1922	22.08	0.90	22.98	3.06	26.04
1923	19.69	0.91	20.60	3.21	23.81
1924	....	....	19.56	†2.62	22.18
1925	....	....	....	....	21.83
Basic Iron					
British India:					
1923	....	....	....	....	26.09
1924	12.51	1.63	14.14	5.03	19.17
1925	....	....	16.49	5.24	21.73
Low-Phosphorus Iron					
Great Britain:					
1922	21.69	0.31	22.00	3.06	25.06
1923	22.02	0.31	22.33	3.21	25.54
1924	18.07	0.31	18.38	†2.62	21.00
1925	....	0.31	....	....	23.02

*Includes Belgium, Germany, France and Luxemburg.

†Based on two entries only.

tained for about 36 per cent of the pig iron production of the United States. These data represent more than 36 per cent of actual production, and costs represent approximately 66 per cent of the production east of the Alleghenies and south of the Ohio River and 30 per cent of the Western district. The weighted average ratio for all the districts studied is 38 per cent.

Heavy Spread in Foundry Iron

Perhaps the most striking table presented in the report is one which deals with a comparison of cost of production of foreign and domestic foundry and malleable iron, in 1924, the complaint relating especially to imports of foundry iron. This table, in showing the differences in the delivered cost per gross ton of pig iron as between the foreign and domestic product, shows a maximum spread of $7.70 in favor of foreign iron. This particular spread is found between the delivered cost of $27.08 for domestic iron and $19.38 for Continental iron, at Boston. The Continental iron came from Germany, France, Belgium and Luxemburg. The spread in similar costs at Philadelphia between Indian iron ($20.01) and domestic iron ($26.42) is $6.41. The costs include transportation and other charges incident to final delivery. The delivered price at Philadelphia of British iron is given at $22.18.

Only a small quantity of the total domestic consumption is supplied by imports. The inland markets, it is pointed out, are supplied by nearby domestic furnaces, while practically all of the imported pig iron is used along the Atlantic, Pacific and Gulf Coasts. Prior to the World War imports occasionally reached an appreciable volume, but from 1909 to 1921, inclusive, the largest importation was 107,547 gross tons. In 1921, only 27,000 tons was imported.

"In 1922, however," says the report, "the extremely low prices in Europe caused an increase to 379,521 tons, or 1.4 per cent of the domestic production. In 1923 and early 1924 imports declined but, beginning with December, 1924, they increased and in 1925 they were 441,425 tons.

Localized Use of Imported Iron

"Nearly all imports are consumed within 200 miles of the port of importation. In recent years of heavy imports the proportion of total imports to total production in the districts most affected (Eastern, Buffalo and Virginia districts) has probably been from 3 to 4 per cent. Of the foundry iron alone, the ratio of imports to production is about 7 per cent."

Imports from India in 1925 totaled 184,325 tons, the highest amount ever coming in a single year from any country. The invoice value per ton is given as $16.39. Imports from Great Britain totaled 96,869 tons, with a value per ton of $19.88. Of the 1925 imports, 89.2 per cent was delivered at Atlantic Coast ports, Philadelphia getting 45 per cent of this total. The report says Great Britain is the source of foundry irons of a wide variety of chemical analyses and also of nearly all the imported high-grade, steel-making iron. Much of this, it is stated, is low-phosphorus, which commands a relatively high price. Imports from British India, it is stated, are principally foundry iron containing a high percentage of manganese.

"This iron has been so well received by American foundrymen that the trade reports it as sometimes commanding a premium over domestic brands," says the report. "As imported pig iron made from Lorraine ores contains a high percentage of phosphorus, it is often lower priced than other pig irons.

Costs Vary With Districts

The Eastern district net plant cost for 1924 is given as $20.18, while the total cost, excluding interest, is given at $21.17 and, with the inclusion of computed interest on depreciated fixed assets at 6 per cent, the total cost is placed at $22.47. Comparable costs for that year are: Alabama district, $14.81, net plant; total, $16.21; Buffalo district, $19.10, net plant; total, $21.32; Western district, $19.75, net plant; total, $21.64. The weighted average total cost for all districts was placed at $21.03.

Another table giving a comparison of cost of production of foreign and domestic basic pig iron, based on total cost delivered at Philadelphia, places the Eastern district cost at $21.98; the Western district cost at $27.30; the Buffalo district cost at $24.59; the Alabama district cost at $19.21 and, lowest of all, British India iron at $19.17, or $2.81 under the Eastern district cost.

The cost of production of foundry and malleable iron in the Eastern district in 1924 was placed at $25.17; for the Alabama district, it was $19.39; for the Buffalo district, $22.17; for the Western district, $24.99; for the weighted average, $21.63. Costs of production of all kinds of pig iron in domestic merchant and steel works furnaces in 1924 were given at $23.52 and $18.44, respectively.

Influence of Low Water Freights

In dealing with competitive conditions existing between domestic and foreign iron the report declares that water rates on the foreign product are so low as to make possible transportation to the United States over long distances. "The rail rates for iron from the inland furnaces of the United States to domestic consumers often considerably exceed the ocean freight rates from foreign countries to our Atlantic seaboard," it is stated. "Pig iron can be shipped for about $3 per ton from Europe to the Atlantic seaboard and for about $4 per ton to the Pacific Coast. The ocean rate from Calcutta, the principal port from which British Indian iron is shipped, is about $5 per ton to Atlantic ports. The domestic coastwise rate from Atlantic to Pacific ports is $6.72 per ton. The combination overland rate of $14 to $23 per ton prevents overland shipments.

"As the market for pig iron is highly competitive, the large foundries which carry large stocks usually buy when prices are low. Such foundries use distress iron and even off-grade pig iron that would otherwise have to be charged back into the furnace as scrap. The buying of all grades of pig iron by the large foundries is made possible by laboratory control mixtures. Much of the domestic pig iron sold in the open market is the product of merchant furnaces. Seventy per cent of such iron is of the foundry grade."

After stating that most furnace plants maintain their own sales offices in the chief centers of consumption, while they sell also through other agencies, the report deals with the manner of quoting and says foreign iron is sold on the same contract basis as domestic, and often by firms which sell the domestic also. Since 1900, it is stated, the general trend of pig iron prices has been slightly upward.

Carnegie Low Bidder on Special Plates for Cruisers

WASHINGTON, March 16.—The Carnegie Steel Co. was the lowest bidder on about 330 tons of specially treated steel plates for scout cruisers Nos. 24 and 25. The bids were opened on Tuesday of last week by the Bureau of Supplies and Accounts, Navy Department. The Carnegie prices range from 12.81c. to 16.86c. per lb., f.o.b. Washington. Bids from the Bethlehem Steel Co. ranged from 23c. to 72c., while the Midvale Co. made a flat bid of 29c. on all items.

Malayan Tin Shipments

WASHINGTON, March 12.—British Malayan tin mines operated at practically full capacity throughout 1925, due to increased demand, according to the Department of Commerce. Tin shipments for the year amounted to 68,570 gross tons of which about 62 per cent went to the United States and 37 per cent to European countries. High prices for tin were maintained, especially the last quarter of the year. The report says that mining and smelting companies paid particularly high dividends.

The Division of Commercial Laws of the Department of Commerce has organized a special tax section which will specialize in the gathering and dissemination of material regarding foreign tax laws, as they affect Americans engaged in foreign trade.

Zinc Coated Products

Meeting Discusses Dropping Word "Galvanized" and the Labeling of Manner of Coating

WASHINGTON, March 16.—The proposed substitution of the term "zinc-coated" for "galvanized" was discussed at some length here on Friday of last week at a conference of sheet metalware manufacturers, hardware retailers and others who adopted a program calling for reduction of nearly 25 per cent in the varieties and sizes of commonly-used sheet metal household utensils. The meeting was held under the auspices of the division of simplified practice, Department of Commerce. The proposed substitution of the term zinc-coated for the term galvanized was discussed at some length by Steven H. Tuthill, of the American Zinc Institute.

It was pointed out that zinc coating rather than galvanizing is the current description. There was discussion also concerning zinc coated ware which is generally shaped before the galvanizing operation, although it was pointed out that there are a few manufacturers who used galvanized sheets from which their wares are shaped. A motion was adopted to refer the problem to the Sheet Metal Ware Association for the development of current designations and trade descriptions which would make it possible for the consumer to know the class of goods being bought.

The conference discussed also the old question of adequate zinc coating and it was stated that as a result of the establishing of master brands of sheets under the simplification program the coating has been increased from 15 to 30 per cent and meets requirements of the consuming trade. It was also declared that hot dipping is protection in itself against light coating because it practically insures 3.75 oz. per sq. ft. of steel.

The question of indicating whether the products are galvanized before or after forming received considerable attention and zinc interests are desirous of having the fact made known by labels or otherwise with the understanding that the word zinc would be included in the marking.

Tariff Commission to Hold Hearing on Complaint of Eastern Furnaces

WASHINGTON, March 16.—While the Tariff Commission has set April 20 as the date for hearing the complaint of Eastern merchant blast furnaces which are seeking an increase of 50 per cent in the duty on pig iron, it is assumed that neither this nor other inquiries will be affected by the investigation of the Tariff Commission to be conducted by a Senatorial committee of five, recently selected by Vice-President Charles G. Dawes of the Senate. The Senate committee named includes one Progressive Republican, Robert M. La-Follette, Jr., of Wisconsin; two Republicans, Wadsworth of New York and Reed of Pennsylvania; and two Democrats, Robinson of Arkansas and Bruce of Maryland.

At the same time, the attacks that have been made upon the commission, culminating in adoption of the resolution for its investigation, are held by many to be a possible influence in injuring the standing of the commission. The resolution, introduced by Senator Robinson, was forced through over the protest of the Administration supporters by a coalition of Democrats and insurgent Republicans. The debate on the resolution was heated and brought out unsupported charges of the political activities by the commission which, it was contended, in effect has ceased to function by reason of its internal differences.

New Steel Fabricator at Gary, Ind.

The Walter Bates Steel Corporation, a new industry at Gary, Ind., has let contracts for the building of the first unit of a steel fabrication plant which will specialize in large poles and towers, steel sash, etc. The initial building will be 150 x 200 ft. A second building, 100 x 200 ft., will be started soon and completed by fall. The American Bridge Co. has received contracts for the steel erection of both buildings.

Officers of the Walter Bates Steel Corporation are: Walter A. Bates, president; Luke D. Stapleton, Jr., vice-president; B. C. Johnson, secretary. Mr. Bates was formerly first vice-president of the Bates Expanded Steel Truss Co., East Chicago, Ind. There is no connection between the two companies.

Reduce Steel Rates from Buffalo to Cleveland and Elyria

WASHINGTON, March 16.—Passing upon a complaint of the Columbia Steel Co. and other manufacturers of miscellaneous iron and steel articles in Cleveland, and Elyria, Ohio, the Interstate Commerce Commission in a decision made public on Saturday of last week held that fifth-class rates, which had been charged on steel products, including hot-rolled strip steel, in carloads, from the Buffalo, N. Y., Pittsburgh and Johnstown, Pa., and Wheeling, W. Va., group districts to Cleveland, Elyria and Lorain, Ohio, were unreasonable. Reparation was ordered paid by the railroads. Since the case was heard, new rates established in the American Shipbuilding Co. and Iron and Steel Articles cases went into effect. These, it was held, are not unreasonable, except the rate from Buffalo. It was ordered that the latter be reduced to 23c. per 100 lb. At present the rate from Buffalo to Elyria and Lorain is 25.5c., while to Cleveland it is 25c.

Proposed Bill Would Affect Government Purchases

WASHINGTON, March 16.—Designed to simplify and make uniform Government contract procedure in connection with the purchase of supplies, the Interdepartmental Board of Contracts and Adjustments of the Bureau of the Budget has drafted a bill which would greatly change the law governing Federal purchases of material. It would affect purchases valued at approximately $225,000,000 annually. The measure will be submitted to Congress for action, after it has been studied by members of the cabinet for suggestions as to changes and amendments. The proposed legislation is intended to eliminate apparently conflicting provisions of the present multiplicity of laws.

Nomination of Hunt for Trade Commission Confirmed

WASHINGTON, March 16. — After considerable wrangling and opposition from the so-called progressive Republicans, the Senate last week confirmed the nomination of Charles W. Hunt, of Iowa, to succeed himself as a member of the Federal Trade Commission. The vote was 48 to 20. Opposition coming from so-called progressive Republicans and some Democrats was based on the alleged conservatism of Mr. Hunt, who is a member of the Republican majority of the commission. Mr. Hunt formerly was head of the Iowa Farm Bureau and, when originally named, was classed as a progressive Republican.

Exports of Implements Increase

WASHINGTON, March 12.—Exports of agricultural implements from the United States in January of this year amounted to $8,451,370, which was greater than in any month of 1925 except August, when the value was over $11,000,000. Also they exceeded the exports of January, 1925, by nearly $4,000,000, according to the agricultural implements division of the Department of Commerce.

Continued large shipments of wheel tractors, of which 6942, valued at $3,522,808, were exported, are the chief cause of growth. This is approximately three times the number and value of wheel tractors exported in January, 1925.

Want to Extend Mileage Scale

Illinois and Central Freight Association Lines Wish to Apply Jones & Laughlin Scale in Wider Territory

WASHINGTON, March 16.—Railroads both in Central Freight Association and Illinois Freight Association territories have petitioned the Interstate Commerce Commission for the right to extend application of the Jones & Laughlin scale. This fact became known yesterday when the commission announced that Illinois Freight Association lines have asked for so-called fourth-section (long-and-short haul) relief in connection with the establishment of rates on iron and steel in their section. It was also disclosed that the Illinois Freight Association already has filed its tariffs, which show that it proposed to extend groups of origin to Milwaukee and St. Louis, instead of confining the points of origin to the Chicago district as the decision of the commission requires. The Central Freight Association lines have asked the permission of the commission to apply the Jones & Laughlin scale to the entire Central Freight Association territory, and also to Cumberland, Md., a steel producing point.

The assumption is that the railroads believe that if these applications are granted the disputes as to rates from grouping centers and intermediate points will be avoided. The commission has not made known whether it will hold a hearing on the applications or not. It is thought that a hearing could be held and action taken in time for application of the Jones & Laughlin scale, which the commission has ordered shall become effective from the Pittsburgh district on or before May 29.

The Illinois Freight Association tariffs filed under the Jones & Laughlin scale had been dated March 15, but this date was canceled before actual filing with the commission. The effective date named was April 15, and while this date remains uncanceled, it is believed the Illinois Freight Association tariffs will not be permitted to go into effect before the Central Freight Association tariffs are made operative.

The Illinois Freight Association tariffs would apply from the Chicago, St. Louis and Milwaukee groups to points in Illinois, Indiana, Iowa, Kentucky, Missouri, and Wisconsin and would greatly change the iron and steel rate fabric in that section of the country, as would the proposal of the Central Freight Association in the still wider area it affects. The Central Freight Association lines have not yet filed tariffs.

The tariffs of the Illinois Freight Association lines would indicate that they adhere substantially to the Jones & Laughlin scale, as distinguished from the general practice of grouping destinations. Indicative of this are the proposed rates to points which are not far apart but at a distance in the scale where the rates break. Among these are cities generally classed as common river points. There are, however, departures from this plan. An example of two Mississippi River towns, only 20 miles apart, taking different rates are Keokuk and Fort Madison, Iowa. The proposed rate from Chicago to Keokuk and Alexandria, Mo., only a few miles apart, is 20c., while the proposed rate to Fort Madison is 19c. An example of the same rate from different groups is the proposed rate of 17c. to apply from both Chicago and Milwaukee to Dubuque, Iowa, situated on the Mississippi River. From Chicago to La Grange and Canton, Mo., also situated on the Mississippi River, the proposed rate is 20c., while from St. Louis the proposed rate to these two points is 17c. The proposed rate from Milwaukee to La Grange and Canton is 23c. The proposed Chicago-St. Louis rate is 22c., while the proposed Milwaukee-St. Louis rate is 25c. The proposed rate from both Chicago and Milwaukee to Galena, Ill., is 17c.

The Illinois Freight Association application says its purpose is to establish rates between Chicago, Milwaukee and St. Louis and grouping points in its territory, "observing reasonable grouping of origin and destination points."

Refuses to Reduce Freight Rates to Pacific Coast

WASHINGTON, March 16.—With iron and steel articles constituting the most important items in the application and Chicago and Pittsburgh mills taking opposing views, much interest has been manifested by the steel industry in the decision of the Interstate Commerce Commission last Saturday which denied for the second time efforts of transcontinental railroads to reduce rates to Pacific Coast terminals without reducing rates to intermediate points.

For the iron and steel industry the chief interest was in the proposal to cut the rate on iron and steel products from Chicago to the Pacific Coast, generally from $1 to 80c. per 100-lb., although other rates were proposed on a number of items, such as steel rails, which would have been reduced from $20 to $16 per gross ton. The Chicago district mills, with the exception of those of the United States Steel Corporation, favored the proposed cuts, while the Pittsburgh mills, along with Eastern manufacturers generally, opposed them.

Most of the iron and steel products listed for the proposed reductions move from Pittsburgh to Baltimore, the nearest port, at a rate of 31c. per 100 lb. The rate on these products from Baltimore to the Pacific Coast ports by water is 40c., producing a combination rate from Pittsburgh of 71c. With incidental charges, such as wharfage, handling, insurance, etc., this rate is brought up to 76.5c., which the transcontinental carriers were seeking closely to approach if not actually to meet to place their rates from Chicago on an equality with the rail-and-water rates available to the iron and steel producers in the Pittsburgh district.

Generally, manufacturers on the Pacific Coast were opposed to granting the application since to do so, it was claimed, would open a new competitive field.

Appointments in War Department Business Council

WASHINGTON, March 16.—Meeting here for the first time on Saturday of last week to give advice on War Department procurement matters, civilians making up the newly organized War Department Business Council were assigned to various branches in connection with the work of military preparedness for national defense. James B. Bonner, in charge of the Washington office of the United States Steel Corporation, was assigned to the Ordnance office, and Howard Coonley, president Walworth Co., Boston, was assigned to the Chemical Warfare Service.

Agricultural Machinery Association Formed in Germany

WASHINGTON, March 16.—A national association of German agricultural machinery producers, comprising 400 factories with a nominal staff of 60,000 laborers, has been formed recently in Berlin, according to the European Division of the Department of Commerce. The new organization is to encourage the mechanical development of agriculture and to promote German agricultural machinery competition on the world market.

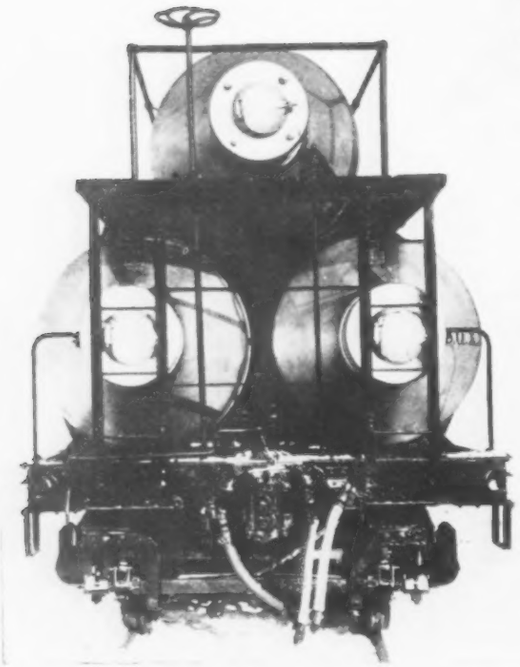
Commercial Agreement with Rumania

WASHINGTON, March 12.—Awaiting only the ratification by the Rumanian Parliament to become effective, a temporary commercial agreement between the United States and Rumania has been concluded, according to a cablegram received by the Department of Commerce from Minister W. S. Culbertson, Bucharest. The agreement gives mutual assurances of most-favored-nation terms in tariff matters.

Cars for Helium Gas

What the Bethlehem Steel Co. Is Building for Government Air Services

WASHINGTON, March 16.—The Bethlehem Steel Co. has delivered to the Army air service a tank car on which are mounted three large cylinders which will be used for transporting helium gas from the plant to the airdomes. A similar car is being built for the air service of the Navy Department. These cars and tanks were built owing to the need of better facilities to carry helium gas. The cylinders have a total content of 1516 cu. ft. and will hold 206,000 cu. ft. of helium gas under



Two Cars to Carry Each Three Helium Tanks With Gas at 2000 Lb. Pressure Are Being Delivered, One to the Army and One to the Navy Air Service

2000 lb. of pressure. This is sufficient to inflate an ordinary-sized blimp.

Before the development of this tank car helium gas was carried in small cylinders, 1200 of which were necessary to inflate an airship of 210,000 cu. ft. capacity. In emptying the small cylinders about 15 per cent of the gas was lost through leakage. The development of the large tanks has resulted not only in reducing this waste, but also in cutting down the amount of work necessary in tapping so many small cylinders.

Fabricated at Bethlehem, Pa., from a single steel ingot, hollow forged in the mandrel, neck bound at each end and not more than 14-in. in diameter, each tank is fitted with an end or cover plate of steel forced against a gasket on a machine-ground surface to insure permanently tight joints. The specifications provide that the tanks and car shall not weigh more than 200,000 lb. with preference for a weight of 180,000-lb. to 185,000-lb. The cars were built at the Cambria plant of the Bethlehem Steel Co. in Johnstown, Pa. The army tanks are made of carbon-vanadium steel.

Structural Steel Week in California

LOS ANGELES, March 11.—When Charles F. Abbott, of New York, secretary of the American Institute of Steel, comes to Los Angeles to participate in Structural Steel Week, scheduled to open here on March 22, plans for the establishment of a Pacific Coast headquarters of the institute, either here or at San Francisco, will be laid before him, according to Robert P. Miller, chairman of the California Institute of Steel Construction.

A conference of the California Institute of Steel Construction, which is composed of all of the steel fabricators of the southern part of the state, was held recently at Del Monte. The agitation for the establishment of a Pacific Coast headquarters took form at that conference, and a petition requesting such action was wired by the officials of the California institute.

Structural steel week was launched as an annual event a year ago by the California institute. During the event this year there will be in attendance, besides Chairman Miller, Lee H. Miller, of Cleveland, chief engineer of the American institute, who is slated for a number of addresses at meetings now being arranged.

Campaigning for a Wider Use of Structural Standards

How standardization and the introduction of better business methods are lowering the cost of steel frame building construction is being told to fabricators, contractors and architects at a series of meetings which are being held in 16 large cities. These meetings are conducted by the American Institute of Steel Construction and the principal speakers are Charles F. Abbott, executive director, and Lee H. Miller, chief engineer.

Particular emphasis is being placed on the use of the 18,000-lb. unit stress in the Institute's standard specifications, since the use of this stress makes possible a saving of about 12 per cent in the amount of steel needed for a structure, as compared with a stress of 16,000 lb. per sq. in. Mr. Miller, at the Cleveland meeting, March 11, pointed out the saving following the use of the standard specifications in the 60 cities which have adopted them. New York, Chicago and Cleveland are three large cities which are not yet in line. The American Railway Engineering Association, said Mr. Miller, has taken up a study of the matter with a view of possibly adopting a modified unit stress for railroad bridges.

Meetings have been held in Philadelphia, Cleveland, Syracuse and New York. Meetings will be held in Atlanta, March 20; New Orleans, March 22; Houston, March 24; Los Angeles, March 26-30; San Francisco, April 1-3; Portland, Ore., April 5; Seattle, April 7; Denver, April 9; Kansas City, April 12; St. Louis, April 14; Indianapolis, April 16, and Cincinnati, April 19.

Large Decrease in Steel Corporation's Unfilled Orders

A fairly large decrease in the unfilled orders on the books of the United States Steel Corporation was reported as of Feb. 28. The total unfilled orders amounted to 4,616,822 tons, a decrease of 265,917 tons from the total of 4,882,739 tons on Jan. 31. This is the second decrease since August last year, the first having been in January when it amounted to 150,625 tons. The increases which were registered from September to December inclusive, ranged from 204,494 tons as the minimum to 472,597 tons as the maximum in November. Decreases previous to September occurred from March to August inclusive. A year ago the unfilled business was 5,284,771 tons, or 667,949 tons more than at the end of February this year. The following table gives the unfilled tonnage as reported by months beginning with January, 1924.

	1926	1925	1924
Jan. 31	4,882,739	5,037,323	4,798,429
Feb. 28	4,616,822	5,284,771	4,912,901
March 31	.....	4,863,564	4,782,807
April 30	.....	4,446,568	4,208,447
May 31	.....	4,049,800	3,628,089
June 30	.....	3,710,458	3,262,505
July 31	.....	3,539,467	3,187,072
Aug. 31	.....	3,512,803	3,289,577
Sept. 30	.....	3,717,297	3,473,780
Oct. 31	.....	4,109,183	3,525,270
Nov. 30	.....	4,581,780	4,031,969
Dec. 31	.....	5,033,364	4,816,676

The high record in unfilled orders was 12,183,093 tons, at the close of April, 1917. The lowest was 2,674,757 tons, on Dec. 31, 1910.

Wheeling Steel Corporation Earns More in 1925 Than in 1923

Few steel companies made a better showing in earnings in 1925 than did the Wheeling Steel Corporation, annual report of which has just been issued. Earnings from operations not only were $3,924,563 greater than those for 1924, but actually ran $178,373 ahead of those for 1923, regarded as the best year the steel industry has had since the war. This showing was made in the face of much lower selling values in 1925. Net profits for the year, in spite of larger charges, were approximately five times those for 1924 and $1,178,134 less than in 1923. The company deferred payment of $1.80 per share on preferred A stock, an 8 per cent cumulative issue, and $2.25 per share on preferred B stock, calling for 10 per cent. Full dividends on these classes of stock, however, were earned by a wide margin, the year's net surplus being $2,017,827, against a deferred dividend amount of approximately $500,000. The company retired bonds to the amount of $1,141,000 par value. Sales, exclusive of intercompany shipments, in 1925 were $80,652,785, against $64,810,524 in 1924 and $71,738,502 in 1923. The report, signed by Alexander Glass, chairman, and Isaac M. Scott, president, says:

> From the standpoint of volume, the business done during 1925 was, on the whole, satisfactory—shipments being greater than for either of the two previous years. Prices, however, were lower; this also being true of costs. Selling values averaged approximately $4 per ton below those of 1924 and $10 per ton below 1923. Lower costs were made possible by the more regular mill operations and the wider use of improved equipment. There were no changes in wage rates except in cases where the rate is based on the selling value of the commodity produced.
>
> In addition to the ordinary repairs and replacements, $2,301,724 was spent on betterments to property, of which $1,487,850 was capitalized and $813,874 was charged to depreciation. Since the formation of the corporation, approximately $30,000,000 has been expended for permanent improvements. The corporation's properties are in excellent physical condition. Outside of the coke plant extension, no further additions have been decided upon.

The earnings compare as follows:

	1925	1924	1923
Net earnings	$8,777,393	$4,852,830	$8,598,920
Other income	726,970	589,294	516,646
Gross profit	9,504,363	5,442,124	9,115,566
Deductions for depreciation, depletion, interest and taxes	5,431,067	4,577,013	3,864,136
Net profit	4,073,296	865,111	5,251,430
Surplus Jan. 1	5,772,010	9,645,022	6,010,902
Total surplus	9,845,306	10,510,132	11,421,720
Dividends—			
Preferred A	307,092 (6.20%)	508,178 (15%)	85,142 (6%)
Preferred B	1,748,377 (7.75%)	4,229,944 (18.75%)	1,691,499 (7.50%)
Total dividends	$2,055,469	$4,738,122	*$1,776,697
Net surplus	7,789,837	5,772,010	9,645,022

*Includes $56.25 paid on stock of subsidiary company not held by Wheeling Steel Corporation.

Jones & Laughlin's Third Annual Report

Annual report of the Jones & Laughlin Steel Corporation, Pittsburgh, for 1925, shows total earnings before depreciation and interest of $15,671,582. The balance after interest and depreciation is $9,954,494. Dividends on the preferred stock, amounting to $3,993,381, reduced the balance to $5,961,113, which was carried to surplus.

After appropriating $100,000 to the pension fund, the consolidated surplus account at the end of the year stood at $40,941,835. The balance sheet shows assets and liabilities amounting to $190,949,215, of which $107,969,751 represents land, plants, mines, steamships, etc. Current assets are listed at $77,162,195, of which inventories account for $27,933,858. Current liabilities are $10,086,885.

Production for the year included 2,078,534 gross tons of iron ore and 417,993 tons of limestone. Coal and coke, to the extent of 3,348,175 and 1,823,431 net tons respectively, were produced. The pig iron output was 2,050,341 gross tons; steel ingots, 2,474,576 gross tons. Shipments for the year of all steel products aggregated 2,063,520 net tons. The average number of employees was 22,111, and the total payroll was $45,030,919, or an average of $2,037 per man.

Advance in Sheet Mill Tonnage Wage Rates

Tonnage rates paid sheet and tin mill workers in mid-Western mills operating under the sliding scale wage agreement of the Amalgamated Association of Iron, Steel and Tin Workers advance 3 per cent of the base rate for March-April as a result of the bimonthly examination of sales sheets conducted March 12 at Warren, Ohio. The average selling price of Nos. 26, 27 and 28 gage black sheets shipped by mid-Western mills during the 60 days ended Feb. 28 was disclosed as $3.20 per 100 lb., an increase from $3.10, the average for two months previously. Benefited workers will be paid 31½ per cent above base under the new rate.

Owing to the death of James H. Nutt, who had acted for manufacturers at the bimonthly settlements since 1912, when the Western Sheet and Tin Plate Manufacturers Association was organized, J. W. Hughes, assistant to the vice-president of the Trumbull Steel Co., Warren, acted for the employers; M. F. Tighe, Pittsburgh, president of the Amalgamated association, represented employees.

Oil Burner Association to Hold Convention and Exposition

An exhibit to illustrate the development of the oil burner industry and of oil burning equipment will be a feature of the third annual convention of the American Oil Burner Association, which will be held at the Book-Cadillac Hotel, Detroit, April 6, 7 and 8.

Addresses and papers relating to oil burning problems will be given at morning and afternoon sessions. Among the speakers will be Edward S. Adams, Timken-Detroit Co., Detroit; M. E. Simpson, Northern Machinery Co., Minneapolis; Henry Loebell, Henry L. Doherty Co., New York; J. L. Breese, Breese Engineering Co., Chicago; and C. F. Olmstead, technologist of the association. The executive secretary of the association is L. D. Becker, 350 Madison Avenue, New York.

COMING MEETINGS

April

American Oil Burner Association. April 6 to 8. Third annual convention and exposition, Book-Cadillac Hotel, Detroit. Leod D. Becker, 350 Madison Avenue, New York, secretary.

National Metal Trades Association. April 15 and 16. Twenty-eighth annual convention, Hotel Astor, New York. J. E. Nyhan, Peoples Gas Building, Chicago, secretary.

American Welding Society. April 21, 22 and 23. Annual meeting, Engineering Societies Building, New York. Miss M. M. Kelly, 33 West Thirty-ninth Street, New York, secretary.

Foundry Equipment Manufacturers' Association. April 22 and 23. French Lick Springs, Ind. H Cole Estep, Penton Publishing Co., Cleveland, secretary-treasurer.

American Electrochemical Society. April 22 to 24. Annual meeting, Chicago Beach Hotel, Chicago. Colin G. Fink, Columbia University, New York, secretary.

National Foreign Trade Council. April 28, 29 and 30. Thirteenth annual convention, Charleston, S. C. O. K. Davis, India House, Hanover Square, New York, secretary.

ESTABLISHED 1855

THE IRON AGE

A. I. FINDLEY, *Editor* — W. W. MACON, *Managing Editor*

Member of the Audit Bureau of Circulations and of Associated Business Papers, Inc.

Published every Thursday by the IRON AGE PUBLISHING CO., 239 West 39th Street, New York

C. S. BAUR, *General Advertising Manager*

F. J. Frank, *President* — George H. Griffiths, *Secretary*

Owned by the United Publishers Corporation, 239 West 39th Street, New York. Charles G. Phillips, *Pres.* A. C. Pearson, *Vice-Pres.* F. J. Frank, *Treas.* H. J. Redfield, *Secy.*

BRANCH OFFICES—Chicago: Otis Building. Pittsburgh: Park Building. Boston: 425 Park Square Building. Philadelphia: 1402 Widener Building. Cleveland: Guardian Building. Detroit: 7338 Woodward Ave. Cincinnati: First National Bank Bldg. Buffalo: 833 Ellicott Square. Washington: 536 Investment Building. San Francisco: 320 Market St. London, Eng.: 11 Haymarket S.W.1.

Subscription Price, United States and Possessions, Mexico, Cuba, $6.00; Canada, $8.50; Foreign, $12.00 per year. Single copy 25 cents.

Entered as second-class matter, June 18, 1879, at the Post Office at New York, N. Y., under the Act of March 3, 1879.

PRINTED IN U. S. A.

Boston & Maine Buys German Rails

SINCE Henry Ford's Detroit, Toledo & Ironton Railroad late in 1924 bought 10,500 tons from a Belgian mill, the most noteworthy purchase of foreign rails by an American railroad is that of 15,000 tons just negotiated by the Boston & Maine. The order has been placed with the well known Krupp plant at Rheinhausen, Germany, and in addition to rails it is understood that the contract calls for upward of 5000 tons of tie plates. Nothing has been given out as to the price of the rails or the accessories, though German basic open-hearth rails have been quoted for some time at the equivalent of $31 to $32 at Continental channel port. As German exports of steel are in the hands of a revived Verband, such as functioned so efficiently in pre-war days, there is the likelihood that a figure somewhat lower than the above quotation was made available to the New England buyer, especially if there was French or Belgian competition for the order.

The Boston & Maine differs from the trunk lines which are the largest patrons of domestic rail mills in that it has practically no freight from the assembling of the raw materials of iron and steel production. Unlike such lines, it cannot benefit by being able to load the rails it buys into its own cars at the mill and haul them at cost to any point on its line, however distant. Being remote from the centers of steel production, and being able to load imported rails from ocean steamer into its own cars, the Boston & Maine has been for some time canvassing the proposal to buy abroad. Whether the saving on the 20,000 tons of rails and accessories it has bought in Germany be $8 or $10 a ton, or even more than the higher sum, it was apparently regarded as sufficient to outweigh the considerations commonly urged in favor of preferring home producers.

The Boston & Maine management, being free from such political trammels as led the New York aldermen to rule out German cast iron pipe, even though much cheaper than domestic pipe, have made their decision on grounds that have been influential with various private buyers of steel located along the Atlantic and Pacific seaboards or on the Gulf, and that have added steadily to the incoming stream of steel from Continental mills. It is not a large stream—about 1½ per cent of the volume of domestic steel production—and still much exceeded by the export stream from American mills. Yet it cannot be said of steel, as has been said of some manufactured products, that excessive tariffs prevent our European debtors from doing business with us. Railroad freights, rather than the tariff, are keeping imports of foreign steel at the present modicum, and there is not a remote chance that the agitation for increased imports will be converted into a campaign for a horizontal lowering of railroad rates to allow European steel to penetrate to interior points.

Steel Production and Consumption

IT is easy to ride a hobby too hard, and it looks as if we were doing that in connection with information as to the rate at which the steel producing industry operates. If there is a mistake, it is made by the outsiders and the insiders alike.

Adages and catch-phrases often do harm by being overworked or by being accepted too literally. Undoubtedly misconception has occurred in recent years by application of the dictum "Steel is the barometer of trade." It is not so true as it used to be, and we have made such progress in the gathering of statistical information in general that we ought to depend much less than formerly upon steel buying and steel production as an index to general trade.

The fundamental fact by which both these criticisms may be tested is that steel is essentially a raw material, and is a raw material for a wide variety of products, using the word "products" in a broad sense—from oil wells to apartment houses, from freight cars to automobiles, from mining machinery to agricultural machinery.

When steel is taken as the measure of current business activity it is taken in terms of tons, whether of orders or of production, yet it makes a very great difference as a measure of industrial activity whether a ton of steel goes into an oil well or an apartment house, into a freight car or an automobile. There is much less expenditure on the

project in the one case than in the other. The finished automobile sells at many times as much per pound as the finished freight car. A totally different kind of activity or prosperity is indicated by a ton of steel going into mining machinery and a ton going into agricultural machinery. Thus tons of steel are not an accurate measure of commercial activity.

When it comes to the matter of steel being "barometric" we may be just as far astray, while we have certainly been getting out of date. The old idea fully recognized the fact of steel being a raw material, the barometer idea being based on that very point. For any enterprise the raw material is naturally bought first, and in the old days it used to be bought far ahead.

Times are different now in two respects. It has been found that there is no occasion to buy steel so far ahead as formerly, which is one important point. The other is that, with the greater range of our quest for business news, we should be able to get more knowledge directly from the sources of the steel demand. We ought not to have to wait until an industry buys steel to learn that it has good prospects. Those who place the orders for steel have definite knowledge before they buy that they will need it. That knowledge should be sought by those who wish to gage the future of business. It is earlier and thus more barometric than the knowledge that the steel has been bought.

We should have more statistical information than we do have about specific conditions in steel consuming industries. Such information would be helpful to the steel producing trade, and by that very token it would be more useful to the outside observer than is statistical information as to the condition the steel trade has already reached at any given moment. Among the most interesting and useful business statistics we have are those, for instance, of building contracts, of oil production and of railroad ton-mileage. All are barometric of steel buying.

Organization Study Pays Dividends

INTENSIVE effort has been put forth by many railroads to earn an adequate return under present-day restrictions, and much of it has borne good fruit. Similarly, close analyses of conditions by manufacturing companies undoubtedly could be made to pay dividends. During 1925 the saving in fuel by the railroads, compared with 1923—a year of approximately equal freight volume—amounted to about 13 per cent. This saving is attributed to several factors: Improved locomotives with high tractive power; increase in the length of their average runs; educational programs to instruct firemen and to encourage fuel conservation; closer inspection of coal purchases; greater expedition in handling trains through terminals, thus reducing delay in transit and expediting train movements, without necessarily increasing actual speed.

Such a study of the operations of a manufacturing or commercial organization has been found many times to point to short cuts, financial savings, conservation of space, elimination of unnecessary routine or records, avoidance of elements of waste, and better utilization of plant and equipment. Such studies have been effectively made by engineers specializing in the work. Often the consultant's viewpoint is necessary, but a great deal can be done inside before calling upon him, and frequently conditions can be so greatly bettered that the outside help is not needed at all.

Notable Steel Revival in France

FRENCH steel output has been expanding rapidly. November exports, at 390,200 tons, were the largest since the war and brought the average for the six months, June to November, to 341,500 tons per month, or nearly 48 per cent above the average rate in 1924, which was 231,100 tons. No other European country made such a gain. Also the November pig iron output, 728,200 tons, was the largest for France last year and the largest for any European country except Germany. In steel the November production of 637,000 tons brought the five months' average to 627,800 tons, or 11 per cent in excess of the 1924 monthly rate of 566,000 tons.

Today France ranks second only to Germany in steel output and first in exports among European countries, including Great Britain. In 1913 the French industry exceeded only Belgium and Luxemburg in pig iron and steel output and in exports it trailed Germany, Great Britain and the United States. Its post-war recovery and the position it occupies today will compel some amendment of the long standing opinion of France's ability to sell iron and steel in world markets.

Business Is Conservative

MORE than a fortnight has elapsed since the slump in Wall Street and it is observed with much satisfaction that commodity prices and the volume of business have not been adversely affected. Comment is made that here is practical confirmation of the belief previously held that the conduct of business has been on a sound and conservative basis.

It has not been uncommon for a sharp decline in stock market values to be followed promptly by serious disturbance in business. Often it has been debated, indeed, whether the decline in Wall Street was a cause of an unfavorable turn in business or was rather a disclosure of an unsound situation. The two cases would not be so dissimilar, however, for there would have to be some unsoundness in business for the stock market to affect it. The recent crash may well be treated as an overdue sequel of the pool operations of last year, particularly their incontinent renewal after the break of last November. Thus in the past fortnight Wall Street has been dealing in the main with the inevitable results of its speculative excesses.

The fact that "business" has been little affected by the recent break in the stock market shows that "business" as it has been conducted is, so to speak, "all right," though it does not follow from this that everything is all right. Business concerns have been proceeding conservative-

ly, making commitments only for materials they were certain to need, and commodity prices have not been on an inflated basis. There has been no little complaint, indeed, of their being too low in many cases, and no serious complaint in any quarter of their being too high.

All the material affairs of the nation, however, are not by any means included in what is commonly called "business," involving commercial enterprises, production, distribution and consumption of commodities. There are two other big classifications—investment affairs, much broader than the mere market for shares of stock, and the affairs of individuals. There may be much wrong with investments. Share values may be too high even with the manufacturing enterprises represented by the shares being in position to buy, produce and sell on a large scale. Some of the Stock Exchange prices have been without justification in present or prospective earnings. Real estate values in some places have been pushed out of line with possible earnings from rentals. The foreign securities that have come to this country, in excess of ten billion dollars, are not fully digested and it is not certain that they will prove digestible.

Then there are the affairs of individuals—those included in the buying of dwelling houses, automobiles, radio, household goods, etc. These are important, both because they run into many billions of dollars and because there is no means of any team work being done if an adverse trend begins. There was no small stimulus to trade in 1925 in the inducements which led individuals to contract for both luxuries and necessities months in advance of earning enough money to cover such purchases. Presumably, however, these credits have been handled with more than ordinary margins of safety, for warnings on instalment buying have been flying for many months.

A factor about which little has been said anywhere is the unusual amount of outside speculation in the past year by business men. With profits slow and difficult in their own businesses, as competition has grown sharper, some men have been attracted by the prospect of profits in a quick speculative turn. If only a part of what the average business man hears of the success members of his own circle have had in such ventures is true, our prosperity is not in danger from this direction. However, the whole story cannot yet be told.

In brief, what is outstanding in surveys that are being made, to appraise the effects of the Wall Street crash, is that it is not business as such that is unsound, but that if dangers exist they are to be sought elsewhere and that their reckonings are not immediate.

ALLOYS in pig iron have their value but there are cases where their presence is harmful, as producers of malleable pig iron have been finding. Desirous of using scrap steel and iron where possible, they have found that they were introducing certain alloys into the charges, alloy steels being now in such general use that their inclusion in ordinary scrap is common. While some metals are either harmless or are slagged out during smelting, chromium in particular must not exist in pig iron for malleable castings. Their heat treatment is interfered with and vital properties are affected. Blast furnace men, therefore, have found it necessary to eliminate scrap entirely in making malleable iron. As time goes on the alloy scrap problem will become more serious, even for steel makers themselves. More and more scrap is becoming impregnated with alloys and ultimately the production of plain carbon steel may be affected.

Why "Progressives"?

PROGRESS is defined lexicographically as a moving forward; an advance physically, mentally or morally. Derivatively a progressive is one who so moves. These definitions prompt us to consider the political significance of progress and progressive. The inquiry is pertinent, seeing that the Senate the other day directed that the Vice-President appoint a "Progressive Republican" as a member of the committee to investigate the Tariff Commission.

There is in Congress, especially in the Senate, a group comprising some nominal Republicans and some nominal Democrats who are called the "Progressives." Strange does it appear that when the main body is sincerely and non-partisanly making progress toward taxation reform the "Progressives" with singular unanimity do not want to make any progress. If there be matters such as extravagant surtaxes, inheritance confiscations, publicity of personal payments, etc., that enlightenment and common sense have condemned, the "Progressives" are found standing as a unit to uphold them.

Progressivism in the political sense appears, therefore, not as the desire to move forward, but rather to move backward, or sidewise or up in the air. It is a far cry from the constructive progressivism of Theodore Roosevelt to the wilfulness of Brookhart, Wheeler & Co.

AT a recent gathering of roll makers, roll designers and roll shop superintendents in Pittsburgh it was suggested that with so many present it would be a good time to organize an association to function along the lines of other technical organizations within the steel industry. Unfortunately, the proposal seemed to fall on deaf ears. "Unfortunately" is used advisedly, because if there is one line of research in the steel industry in which cooperative investigation could be carried on profitably it is the design and performance of rolls. Incidentally such effort might correct the impression that roll makers and designers are oversecretive and are holding back much that might well be told. There is no great mystery about designing rolls to produce a given section, but not too much light has been shed on the whys and wherefores of roll performance. The industry would be well served by an organization that would go into these and related questions. The little on rolling mill practice that the American Iron and Steel Institute has been able to get into its proceedings has been highly appreciated.

Machining Uninfluenced by Hardness

Cast Iron's Wear and Susceptibility to Machining Dependent on Structural Form of Carbon—Fracture Tests Important

THE machineability and wear of a casting are not dependent upon the hardness of the iron, according to E. J. Lowry, metallurgist Hickman, Williams & Co., who delivered an address before the New England Foundrymen's Association at the Exchange Club, Boston, Wednesday evening, March 10. Moreover, according to the speaker, the physical characteristics of the carbon in the iron are the most important influence determining machineability and wear. Fracture tests, upon which the foundrymen were formerly entirely dependent, are of more value than chemical analyses in ascertaining whether a given pig iron will yield a good casting.

These revolutionary pronouncements were high points in a discussion which was divided into three parts, the first dealing with the influence of pig iron on the casting, the second showing the relation of analysis and hardness to machineability, and the third pertaining to the influence of carbon growths in the pig iron, caused by varying blast temperature, on the characteristics of the subsequent castings.

The address was illustrated by 30 slides. The first 10 slides definitely traced carbon structures in pig iron through the melting operations of the cupola to the subsequent castings. The same structures which existed in the pig iron persisted in the castings, as well as in test bars.

A second series of 10 slides showed the results obtained from various pig irons with a mixture in which the combined carbon was held between 0.49 and 0.51 per cent and the total carbon between 3.40 and 3.60 per cent. It was found that, depending upon the pig iron, the silicon content had to be varied from 1.98 to 2.32 per cent in order to obtain the same percentage of combined carbon. It also developed that with the same combined carbon in the irons the Brinell hardness in the castings varied from 140 to 208.

Two typical irons showed the following analyses and Brinell tests:

	No. 1	
3.60 per cent total carbon 0.51 per cent combined carbon 2.30 per cent silicon		208 Brinell hardness
	No. 2	
3.40 per cent total carbon 0.51 per cent combined carbon 2.30 per cent silicon		140 Brinell hardness

Tests for machineability showed that No. 1 required 0.38 kwhr. machine power, as against 0.65 kwhr. for No. 2. Tests for transverse strength showed 3550 lb. per sq. in. for No. 1 and 2925 lb. per sq. in. for No. 2.

All other elements besides those mentioned above were the same for both irons. The pouring temperatures were identical and the cooling rates were as much alike as careful practice would permit.

Fracture tests showed a marked difference between the two irons. The fracture of No. 2 was spotted and irregular in marked contrast with the uniformity of the No. 1. Under the microscope the fractures were seen to be produced by the structure of the carbon. No. 2 had a predominance of round temper form carbon, whereas No. 1 had thin, laminated forms of carbon. It was shown that these carbons produced strains in the iron, the temper form producing the greater strain. These strains, according to Mr. Lowry, could not be measured by hardness tests, but were proved to exist by annealing the castings at 800 deg. Fahr., which did not destroy the hardness, as indicated by the Brinell tests. In the case of No. 2 the machineability test after the annealing showed a decline in machine power consumed to 0.48 kwhr.; for No. 1 the decline was to 0.35 kwhr.

The hardness strains were also demonstrated by machining the castings, obtaining the power consumed, and then straining them, obtaining the power consumed.

The conclusions drawn from the tests are as follows:

1. The forms of carbon existing in the pig iron are carried into the casting through the cupola melting, regardless of the rate of cooling the casting.

2. The form of carbon in the casting is dependent on the kind of pig iron used.

3. Hardness and strength are not reflected in the wear or machineability of a casting; the latter two qualities are dependent on the structural forms of the carbon in the iron.

Ten different pig irons and mixtures were used in the tests made by Mr. Lowry. Four different coke irons figured in the tests. It was found that the hardest machining coke iron was rendered more machineable by additions of charcoal iron. A mixture of equal quantities of the hardest and easiest machining coke irons brought out that the final machineability was equal to one-half of the machining power consumed for the one plus one-half the machining power consumed on the other.

Two tests of mixtures containing 15 per cent and 25 per cent of steel scrap respectively showed that, with the hardness and analysis constant, the machining power required increased 0.01 kwhr. for each 1 per cent of steel scrap introduced.

Referring to blast furnace practice, Mr. Lowry stated that the slower the working of the metal in the furnace the better the iron produced from the standpoint of carbon structure. It has also been found that furnaces using basic slags produce inferior irons with respect to carbons and the physical characteristics which are related to carbons. To obtain an acid slag a furnace must reduce its limestone burden, thereby making the coke ash, which is principally silicon dioxide, the main fluxing material. The character of the slag does not interfere with output, he said. A furnace can obtain just as fast fluxing with an acid as with a basic slag.

Proper sizing of pigs is important in relation to carbon structures, Mr. Lowry added. Frequently inherent carbons in pig iron may be eliminated by casting pigs in smaller or different shaped molds.

Mr. Lowry's investigation was conducted with the cooperation of a number of leading automotive plants. Simultaneously and without knowledge of his work a similar research was carried on by the British Cast Iron Research Association.

Automobile Production at High Level

The large-volume automobile factories with one important exception are now at or above the highest rates of output in their histories. For these companies, first-quarter production will be greater than in any previous year, according to *Automotive Industries*.

Although in some quarters the opinion is expressed that production has been exceeding sales by too wide a margin, it is generally acknowledged that the factories are still in position to curtail in time to avoid serious difficulties should the sales market fail to meet expectations.

Buys Equipment for Rolling Strip Sheets

The Columbia Steel Co. has decided on its mills for its Butler, Pa., plant on which it will roll the new product known as strip sheets. The order calls for four 4-high, 30-16-in. continuous mills and a 2-high, 27-in. universal mill and has gone to the United Engineering & Foundry Co., Pittsburgh.

The Republic Iron & Steel Co., Youngstown, will rebuild its first battery of 43 by-product coke ovens at the Lansingville works, contract having been awarded to the Koppers Co., Pittsburgh.

Iron and Steel Markets

Steel Consuming Industries Busy

First Quarter Prices Carried Into Second Quarter—Car Orders Exceed Last Year's—German Rails for New England—Ferromanganese $5 Lower

THE sustained rate of operation in industries which consume steel is brought out more clearly by the market developments of the first half of March. Steel production is on a scale exceeding the average for January and February, but still without the signs that appeared a year ago of overproduction by several of the leading companies.

There is a good volume of new buying, due in part to the coming on of spring, but these orders plus specifications are still somewhat less than mill shipments.

Mills rolling rails and track accessories have shipped since the first of the year considerably more steel than in the same period last year, rail buying last fall being unusual. On most of the other forms of steel the close connection consumers are making with the mills and the small stocks buyers now have point to a continuance of such business on the present scale well into the second quarter. Yet contracts covering the full second quarter are few.

Sales of the leading finished products for delivery beyond April 1 indicate the carrying over of first quarter prices. The plate market, which for so long has been the weakest spot, is a shade firmer. Steel scrap, after a show of strength in the Pittsburgh district for two weeks, is tending lower.

The Steel Corporation's rate of operations has been above 95 per cent the past week and that of Bethlehem between 85 and 90 per cent. The Pittsburgh district as a whole has been not far from 85 per cent. Steel company production of pig iron is running higher than in February.

In the steadily increasing stream of steel imports to the Atlantic seaboard the order for 15,000 tons of 100-lb. and 85-lb. rails just placed by the Boston & Maine Railroad with the Krupp mill at Rheinhausen, Germany, is conspicuous. The contract includes 5000 tons of tie plates.

It is found that 26,500 railroad cars were ordered between Jan. 1 and March 15, or 10,000 more than in the same period last year. A large part of the 270,000 tons of steel required, besides axles, will come from Chicago mills.

The Central Railroad of New Jersey has inquired for 1000 box cars and 100 gondolas. The Pennsylvania Railroad may authorize the building of 300 locomotives, of which 100 will come from its own shops. The Wabash is inquiring for 30.

Structural steel mills are operating at an extraordinary rate, but after several remarkable weeks fabricating contracts are light. An office building in New York, up for bids, will take 12,000 tons of structural steel and a warehouse in Brooklyn calls for 1800 tons of concrete bars.

Motor car builders, after speeding up purchases for a time, as of sheets, have fallen back to nearby requirement buying.

Spring needs have brought pipe-making operations to a 75 per cent basis, a gain of about 50 per cent from the low point five or six months ago.

Shipments of wire and wire products are now on the upgrade, and not, as they were a year ago, dwindling because the first two months of the year then had completely filled distributers' stocks.

Tonnage wage rates of sheet and tin mill workers in mid-Western mills have been advanced 3 per cent for March and April under the sliding scale agreement, which showed that shipments of black sheets averaged 3.20c. in January and February against 3.10c. in the preceding 60 days.

Connellsville coke production has not yet been cut down to the point of bringing supply and demand in balance, spot furnace coke being available at $3 at oven. Pig iron producers are holding off on second quarter contracts, looking for a price nearer to $3 than to the $3.50 which coke companies ask.

Competition in ferromanganese among domestic producers brought another drop of $5 in the past week, and in buying at $95 consumers are getting a guaranty against further decline. English makers have dropped out of the contest, their last quotation being $110 at seaboard.

In tin the movement above 60c. seems no more difficult than the advance through the fifties. Sales have been made this week at 66c, the highest price since 1920.

Both of THE IRON AGE composite prices are unchanged. That for pig iron is at $21.38 for a second week—the low figure of the year. The finished steel price is at 2.431c. per lb. for the third week.

Pittsburgh

Steel Consumption Large But Buying Limited to Early Needs

PITTSBURGH, March 16.—The demand for steel products is still featured by its persistency rather than the size of the individual orders. The automobile industry is not buying more than a month ahead, and consumers generally are disposed to take full advantage of the promptness with which the mills are making deliveries and the high state of railroad efficiency. However, the fact that total business is sufficient fully to sustain the recent rate of steel works and rolling mill operations, plainly indicates that consumption is sustained and that there is a healthy situation with regard to stocks of steel in second hands. Outside of the structural, tin plate and large pipe mills, it is rare to find finishing mills scheduled more than two weeks ahead, and some classes of mills, notably those rolling strips, cannot look much more than a week ahead.

There is a measure of satisfaction in the steadiness of plant engagement, although a happier condition

A Comparison of Prices

Advances Over the Previous Week in Heavy Type, Declines in Italics
At Date, One Week, One Month, and One Year Previous

For Early Delivery

Pig Iron, Per Gross Ton:	Mar. 16, 1926	Mar. 9, 1926	Feb. 16, 1926	Mar. 17, 1925
No. 2X, Philadelphia‡	$23.26	$23.26	$24.26	$24.26
No. 2, Valley furnace†	20.50	20.50	20.50	21.00
No. 2, Southern, Cin'ti†	25.69	25.69	25.69	24.05
No. 2, Birmingham, Ala.†	22.00	22.00	22.00	20.00
No. 2 foundry, Chicago*	23.00	23.00	23.00	24.00
Basic, del'd, eastern Pa.	22.25	22.25	23.00	23.75
Basic, Valley furnace	20.00	20.00	20.00	21.50
Valley Bessemer, del'd P'gh	22.76	22.76	22.76	24.26
Malleable, Chicago*	23.00	23.00	23.00	24.00
Malleable, Valley	20.50	20.50	20.50	21.50
Gray forge, Pittsburgh	21.76	21.76	21.76	22.26
L. S. charcoal, Chicago	29.04	29.04	29.04	29.04
Ferromanganese, furnace	*95.00*	100.00	115.00	115.00
Rails, Billets, Etc., Per Gross Ton:				
O.-h. rails, heavy, at mill	$43.00	$43.00	$43.00	$43.00
Light rails at mill	35.00	35.00	36.00	40.32
Bess. billets, Pittsburgh	35.00	35.00	35.00	37.00
O.-h. billets, Pittsburgh	35.00	35.00	35.00	37.00
O.-h. sheet bars, P'gh	36.00	36.00	36.00	38.00
Forging billets, base, P'gh	40.00	40.00	40.00	42.50
O.-h. billets, Phila.	40.30	40.30	40.30	41.67
Wire rods, Pittsburgh	45.00	45.00	45.00	48.00
	Cents	Cents	Cents	Cents
Skelp, gr. steel, P'gh, lb.	1.90	1.90	1.90	2.10
Finished Iron and Steel,				
Per Lb. to Large Buyers:	Cents	Cents	Cents	Cents
Iron bars, Philadelphia	2.22	2.22	2.22	2.28
Iron bars, Chicago	2.00	2.00	2.00	2.10
Steel bars, Pittsburgh	2.00	2.00	2.00	2.10
Steel bars, Chicago	2.10	2.10	2.10	2.20
Steel bars, New York	2.34	2.34	2.34	2.44
Tank plates, Pittsburgh	1.85	1.85	1.80	2.00
Tank plates, Chicago	2.10	2.10	2.10	2.30
Tank plates, New York	2.14	2.14	2.09	2.34
Beams, Pittsburgh	1.90	1.90	1.90	2.10
Beams, Chicago	2.10	2.10	2.10	2.30
Beams, New York	2.24	2.24	2.24	2.44
Steel hoops, Pittsburgh	2.50	2.50	2.50	2.40

*The average switching charge for delivery to foundries in the Chicago district is 61c. per ton.
†Silicon, 1.75 to 2.25. ‡Silicon, 2.25 to 2.75.

Sheets, Nails and Wire,	Mar. 16, 1926	Mar. 9, 1926	Feb. 16, 1926	Mar. 17, 1925
Per Lb. to Large Buyers:	Cents	Cents	Cents	Cents
Sheets, black, No. 28, P'gh	3.25	3.25	3.25	3.40
Sheets, black, No. 28, Chicago dist. mill	3.45	3.45	3.45	3.70
Sheets, galv., No. 28, P'gh	4.50	4.50	4.50	4.60
Sheets, galv. No. 28, Chicago dist. mill	4.70	4.70	4.70	4.85
Sheets, blue, 9 & 10, P'gh	2.50	2.50	2.50	2.70
Sheets, blue, 9 & 10, Chicago dist. mill	2.60	2.60	2.60	2.80
Wire nails, Pittsburgh	2.65	2.65	2.65	2.85
Wire nails, Chicago dist. mill	2.70	2.70	2.70	2.95
Plain wire, Pittsburgh	2.50	2.50	2.50	2.60
Plain wire, Chicago dist. mill	2.55	2.55	2.55	2.70
Barbed wire, galv., P'gh	3.35	3.35	3.35	3.55
Barbed wire, galv., Chicago dist. mill	3.40	3.40	3.40	3.65
Tin plate, 100 lb. box, P'gh	$5.50	$5.50	$5.50	$5.50
Old Material, Per Gross Ton:				
Carwheels, Chicago	$17.00	$17.00	$17.00	$17.00
Carwheels, Philadelphia	17.50	17.50	17.50	18.50
Heavy steel scrap, P'gh	*17.50*	18.00	17.50	19.00
Heavy steel scrap, Phila.	**16.00**	15.50	16.00	16.00
Heavy steel scrap, Ch'go	14.00	14.00	13.75	16.50
No. 1 cast, Pittsburgh	17.00	17.00	17.00	19.00
No. 1 cast, Philadelphia	17.50	17.50	17.50	18.00
No. 1 cast, Ch'go (net ton)	17.00	17.00	17.00	18.00
No. 1 RR. wrot. Phila.	17.00	17.00	17.50	19.00
No. 1 RR. wrot. Ch'go (net)	13.00	13.00	12.75	14.50
Coke, Connellsville, Per Net Ton at Oven:				
Furnace coke, prompt	*$3.00*	$3.25	$5.00	$3.25
Foundry coke, prompt	4.50	4.50	6.00	4.25
Metals,				
Per Lb. to Large Buyers:	Cents	Cents	Cents	Cents
Lake copper, New York	*14.25*	14.37½	14.50	14.62½
Electrolytic copper, refinery	13.95	13.95	14.12½	14.25
Zinc, St. Louis	*7.35*	7.40	7.75	7.32½
Zinc, New York	*7.70*	7.75	8.10	7.67½
Lead, St. Louis	*8.00*	8.30	9.00	8.72½
Lead, New York	*8.20*	8.60	9.15	9.00
Tin (Straits), New York	**66.00**	64.00	64.25	53.00
Antimony (Asiatic), N. Y.	*17.00*	19.50	21.37½	15.75

On export business there are frequent variations from the above prices. Also, in domestic business, there is at times a range of prices on various products, as shown in our market reports on other pages.

THE IRON AGE Composite Prices

Finished Steel

March 16, 1926, 2.431c. Per Lb.

One week ago	2.431c.
One month ago	2.424c.
One year ago	2.531c.
10-year pre-war average	1.689c.

Based on prices of steel bars, beams, tank plates, plain wire, open-hearth rails, black pipe and black sheets. These products constitute 88 per cent of the United States output of finished steel.

	High		Low	
1926	2.453c.,	Jan. 5;	2.424c.,	Feb. 9
1925	2.560c.,	Jan. 6;	2.396c.,	Aug. 18
1924	2.789c.,	Jan. 15;	2.460c.,	Oct. 14
1923	2.824c.,	April 24;	2.446c.,	Jan. 2

Pig Iron

March 16, 1926, $21.38 Per Gross Ton

One week ago	$21.38
One month ago	21.54
One year ago	22.13
10-year pre-war average	15.72

Based on average of basic and foundry irons, the basic being Valley quotation, the foundry an average of Chicago, Philadelphia and Birmingham.

	High		Low	
1926	$21.54,	Jan. 5;	$21.38,	March 9
1925	22.50,	Jan. 13;	18.96,	July 7
1924	22.88,	Feb. 26;	19.21,	Nov. 3
1923	30.86,	March 20;	20.77,	Nov. 20

would be orders in sufficient volume to lessen the frequency of mill scheduling. Mills are also encouraged because the recent stock market decline, the weaker market in scrap and the slump in ferromanganese prices have failed to accentuate the caution of steel consumers. Prices continue to hold well and if there is a tendency one way or another, it is in the direction of greater firmness. It adds something to producing costs when mills have to be scheduled as often as they have been lately, and in the case of plates, shapes and bars, the effort toward higher prices finds its explanation in the belief of manufacturers that they are entitled to more profit than present figures yield. There seems to be less shading of the so-called regular market prices on sheets than recently, but on the other hand, cases of deviations from market prices on cold-rolled strips have been frequent enough to attract attention.

The pig iron market has shown no gain in activity, but as the dullness finds its explanation in the fact that most important consumers are well covered against their requirements for next 30 days or longer, producers feel an attempt to secure business now would be successful only at the expense of prices.

The scrap market is again showing some weakness because consumers are not much interested and current offerings must find an outlet. The coke market also is growing weaker because there is not enough demand to absorb the supply. Ferromanganese not only has gone off $5 per ton further, but the report is that producers in their efforts to secure orders are guaranteeing the present price against a decline. On

that basis some tonnage is being secured since the reductions have been generally regarded as forerunners of even lower prices.

Pig Iron.—The notable feature of the market is that prices are holding in the face of an extremely limited demand. A test of the market is lacking because nearly all of the larger consumers are covered against their requirements for the next 30 to 90 days. Moreover, in view of the fact that the coke market is showing no strength, there is a disposition among those who may need second quarter tonnages to hold back till the last minute before buying. Producers do not seem disposed to force sales and consequently recent prices, which are based entirely on small lots, are unchanged. The Westinghouse Electric & Mfg. Co. is in the market for 2000 tons of No. 1 foundry iron and 300 tons each of No. 2 and No. 2X iron for its Cleveland foundry, but a report that the American Sheet & Tin Plate Co. was in the market for a round tonnage of foundry iron for its Canton, Ohio, roll foundry is without foundation. This company has made no formal inquiry for iron, being a constant buyer of another grade used in making rolls. The Standard Sanitary & Mfg. Co. has been expected to be in the market, but it has not yet appeared for the reason that it has considerable iron in stock and under contract for its Northern plants. This company probably will soon buy iron for its Louisville plants, and the expectation is that less Birmingham and more southern Ohio iron will be purchased, due to the high price of the former. The Carnegie Steel Co. is getting ready to light one of its Ohio furnaces in Youngstown which will give it a total of 41 out of 53 furnaces in production. Stack of the Clinton Iron & Steel Co., Pittsburgh, resumed production March 12, after a suspension of about 45 days. Eight of the 10 furnaces at Cambria works, Bethlehem Steel Co., Johnstown, Pa., are now active. The Shenango Furnace Co., Sharpsville, Pa., has banked its No. 1 furnace. Of the 130 furnaces in this and nearby districts, 90 are now in production, which on a numerical basis is approximately 70 per cent.

We quote Valley furnace, the freight rate for delivery to the Cleveland or Pittsburgh district being $1.76 per gross ton:

Basic	$20.00
Bessemer	21.00
Gray forge	20.00
No. 2 foundry	20.50
No. 3 foundry	20.00
Malleable	20.50
Low phosphorus, copper free	$28.00 to 28.50

Ferroalloys.—Another cut of $5 a ton in ferromanganese, effective March 13, by leading domestic producers and one importer of foreign material, puts the market at $95, furnace or seaboard, for all grades except British, which remains at $110, the price named March 4. It develops that some makers did not stop at $100, and it became necessary for the others to name a lower price to meet the competition. So far the reduction in prices has not produced much business. Contracts written at a higher figure were generally revised to the new price, and this gave consumers who were covered no opportunity to hold up specifications in favor of cheaper supplies available elsewhere. Those not covered have been disposed to wait in the belief that prices might drop as low as $90 as a result of the competition. British producers are not participating in the price reduction, because that would mean that they would have to revise the price to British and Continental customers. Their agents have been given permission to sell other material without jeopardizing their sales agreements. Developments in ferromanganese overshadow those in other ferroalloys, in which there is a steady movement against contracts, but not much new business. Prices are given on page 795.

Semi-Finished Steel.—Makers generally are quoting present prices of billets, slabs and sheet bars against second quarter contract tonnages, and some business for that period has been closed at these figures. There is some resistance to the prices, but it is of the passive sort, based on the fact that most non-integrated manufacturers contracted for more steel than the first quarter requirements necessitated. Price maintenance appears necessary; it would not help the manufacturer who buys his steel to sustain finished steel prices if the billets, slabs and sheet bars were cheaper. Moreover, the maker of the semi-finished steel usually is a producer of finished steel and is loath to undermine the finished steel price structure by cutting the unfinished material. The market is not active, but probably will show more life as the end of the month draws near. Wire rods are at $45, base Pittsburgh or Cleveland, for either spot or second quarter shipment. Open market trading in skelp is light, but 1.90c. is a fair appraisal of the price. Prices are given on page 795.

Wire Products.—Demands upon the mills reflect a steady, if gradual, increase in consumption, which though possibly seasonal in character, is satisfactory to producers, especially by comparison with the conditions of a year ago. Then the demand was dwindling in rather rapidly because the heavy shipments of the first two months had completely filled distributors' stocks and the failure of an advance in prices to hold made for a slow movement into consumption. Shipments are now on the upgrade, and the year promises a more constant and better distributed demand than a year ago. Buying still is at short range because the mills are making prompt shipments and there are no signs of higher prices. Mill operations remain at between 65 and 70 per cent, but the general average is closer to the higher figure. Prices are given on page 793.

Rails and Track Supplies.—New business in rails and accessories is light, but specifications against contracts and orders are coming in steadily and the movement from the mills is heavy. Recent prices are well maintained. A rather general revision of spike and tie plate specifications was presented at a meeting in Chicago last week of the American Railway Engineering Association. Light rails are not in active demand and competition for orders is sharp enough to keep prices favorable to buyers. Prices are given on page 793.

Tubular Goods.—In spite of a recent reduction in the price of Pennsylvania crude oil and the possibility of its extension to other producing fields, pipe makers continue to report a growing demand for oil country goods and rather numerous inquiries for plain-end line pipe. Some fair-sized orders for line pipe have been placed. The National Tube Co., well along on an order for 200 miles of 8-in. pipe for the Magnolia Pipe Line Co., recently began rolling 100 miles of the same diameter for the Humble Pipe Line Co. The Standard Oil Co. of New Jersey recently placed 165 miles of 22-in. plain-end pipe with two local mills for a line in Louisiana. Standard pipe is feeling the approach of spring in larger specifications. Pipe-making capacity is now about 75 per cent engaged, a gain of about 50 per cent from the low point of the latter part of last year. Comment is made on the steadiness of pipe prices and the fact that they are more strictly observed than during much of last year. The secondary market is also more orderly. There is a fairly good market in boiler tubes, but there are too many sellers for buyers for prices to show real strength. Discounts are given on page 793.

Sheets.—Prices are growing firmer and sales at below what are regarded as the regular market prices are becoming fewer. It is getting harder for buyers to get black sheets at 3.25c., base Pittsburgh, and, as has been the case in the past few weeks, concessions on blue annealed and galvanized sheets are becoming less frequent. There does not seem to have been any considerable gain in the demand, nor are buyers departing from close range purchasing, least of all the motor car builders, who, after speeding up purchases for a time, have fallen back to nearby requirement buying. Makers appear to feel that business is as likely to come out just as well at full as at cut prices, and this probably explains their firmer stand. Mill operations are holding at about the recent rate, but schedules are short. Prices are given on page 793.

Tin Plate.—Mills in this district are busy and are scheduled well into May at the present rate, which is engaging all mills that can be economically operated. The leading maker is heavily obligated and on April 5 will start up its Pittsburgh works, New Kensington,

Prices of Finished Iron and Steel Products (Carload Lots)

Iron and Steel Bars

Soft Steel

	Base Per Lb.
F.o.b. Pittsburgh mills	2.00c. to 2.10c.
F.o.b. Chicago	2.10c.
Del'd Philadelphia	2.32c.
Del'd New York	2.34c. to 2.44c.
Del'd Cleveland	2.19c.
F.o.b. Birmingham	2.15c. to 2.25c.
C.i.f. Pacific ports	2.35c.
F.o.b. San Francisco mills	2.35c. to 2.40c.

Billet Steel Reinforcing

F.o.b. Pittsburgh mills	2.00c. to 2.10c.

Rail Steel

F.o.b. mill	1.80c. to 1.90c.
F.o.b. Chicago	2.00c.

Iron

Common iron, f.o.b. Chicago	2.00c.
Refined iron, f.o.b. P'gh mills	3.00c.
Common iron, del'd Philadelphia	2.22c.
Common iron, del'd New York	2.24c.

Tank Plates

	Base Per Lb.
F.o.b. Pittsburgh mill	1.85c. to 1.90c.
F.o.b. Chicago	2.10c.
F.o.b. Birmingham	1.95c. to 2.05c.
Del'd Cleveland	2.04c. to 2.09c.
Del'd Philadelphia	2.12c. to 2.22c.
Del'd New York	2.14c. to 2.24c.
C.i.f. Pacific ports	2.30c.

Structural Shapes

	Base Per Lb.
F.o.b. Pittsburgh mill	1.90c. to 2.00c.
F.o.b. Chicago	2.10c.
F.o.b. Birmingham	2.05c. to 2.15c.
Del'd Cleveland	2.09c. to 2.19c.
Del'd Philadelphia	2.12c. to 2.22c.
Del'd New York	2.24c. to 2.34c.
C.i.f. Pacific ports	2.35c.

Hot-Rolled Flats (Hoops, Bands and Strips)

	Base Per Lb.
All gages, narrower than 6 in., P'gh	2.50c.
All gages, 6 in. and wider, P'gh	2.30c.
All gages, 6 in. and narrower, Chicago	2.60c.
All gages, wider than 6 in., Chicago	2.50c.

Cold-Finished Steel

	Base Per Lb.
Bars, f.o.b. Pittsburgh mills	2.50c.
Bars, f.o.b. Chicago	2.50c.
Bars, Cleveland	2.55c.
Shafting, ground, f.o.b. mill	*2.70c. to 3.00c.
Strips, f.o.b. Pittsburgh mills	3.90c.
Strips, f.o.b. Cleveland mills	3.90c.
Strips, delivered Chicago	4.20c.
Strips, f.o.b. Worcester mills	4.05c.

*According to size.

Wire Products

(To jobbers in car lots f.o.b. Pittsburgh and Cleveland)

	Base Per Keg
Wire nails	$2.65
Galv'd nails, 1-in. and longer	4.65
Galv'd nails, shorter than 1 in.	4.90
Galvanized staples	3.35
Polished staples	3.10
Cement coated nails	2.65

	Base Per 100 Lb.
Bright plain wire, No. 9 gage	$2.50
Annealed fence wire	2.65
Spring wire	3.50
Galv'd wire, No. 9	3.10
Barbed wire, galv'd	3.35
Barbed wire, painted	3.10

Chicago district mill and delivered Chicago prices are $1 per ton above the foregoing. Birmingham mill prices $3 a ton higher; Worcester, Mass., mill $3 a ton higher on production of that plant; Duluth, Minn., mill $2 a ton higher; Anderson, Ind., $1 higher.

Woven Wire Fence

	Base to Retailers Per Net Ton
F.o.b. Pittsburgh	$65.00
F.o.b. Cleveland	65.00
F.o.b. Anderson, Ind.	66.00
F.o.b. Chicago district mills	67.00
F.o.b. Duluth	68.00
F.o.b. Birmingham	68.00

Sheets

Blue Annealed

	Base Per Lb.
Nos. 9 and 10, f.o.b. Pittsburgh	2.50c.
Nos. 9 and 10, f.o.b. Ch'go dist. mills	2.60c.
Nos. 9 and 10, del'd Phila'phia	2.82c.

Box Annealed, One Pass Cold Rolled

No. 28, f.o.b. Pittsburgh	3.25c. to 3.35c.
No. 28, f.o.b. Ch'go dist. mill	3.45c.
No. 28, del'd Phila'phia	3.67c.

Galvanized

No. 28, f.o.b. Pittsburgh	4.50c. to 4.60c.
No. 28, f.o.b. Chicago dist. mill	4.70c.
No. 28, del'd Philadelphia	4.92c.

Tin Mill Black Plate

No. 28, f.o.b. Pittsburgh	3.25c. to 3.35c.
No. 28, f.o.b. Chicago dist. mill	3.45c.

Automobile Body Sheets

No. 22, f.o.b. Pittsburgh	4.40c.

Long Ternes

No. 28, 8-lb. coating, f.o.b. mill	4.85c.

Tin Plate

	Per Base Box
Standard cokes, f.o.b. P'gh district mills	$5.50
Standard cokes, f.o.b. Gary and Elwood, Ind.	5.60

Terne Plate

(*F.o.b. Morgantown or Pittsburgh*)

(Per package, 20 x 28 in.)

8-lb. coating, 100 lb. base	$11.40
8-lb. coating I.C.	11.70
15-lb. coating I.C.	14.85
20-lb. coating I.C.	$16.20
25-lb. coating I.C.	17.90
30-lb. coating I.C.	19.45
40-lb. coating I.C.	21.65

Alloy Steel Bars

(F.o.b. Pittsburgh or Chicago)

S. A. E. Series Numbers		Base Per 100 Lb.
2100*	(1½% Nickel, 0.10% to 0.20% Carbon)	$3.20 to $3.25
2300	(3½% Nickel)	4.50 to 4.60
2500	(5% Nickel)	5.70 to 5.80
3100	(Nickel Chromium)	3.50 to 3.60
3200	(Nickel Chromium)	5.00 to 5.25
3300	(Nickel Chromium)	7.00 to 7.25
3400	(Nickel Chromium)	6.25 to 6.50
5100	(Chromium Steel)	3.50
5200*	(Chromium Steel)	7.00 to 7.50
6100	(Chrom. Vanadium bars)	4.20 to 4.30
6100	(Chrom. Vanad. spring steel)	3.80
9250	(Silicon Manganese spring steel)	3.20 to 3.25
	Carbon Vanadium (0.45% to 0.55% Carbon, 0.15% Vanad.)	4.10 to 4.20
	Nickel Chrome Vanadium (0.60 Nickel, 0.50 Chrom., 0.15 Vanad.)	4.45 to 4.55
	Chromium Molybdenum bars (0.80—1.10 Chrom., 0.25—0.40 Molyb.)	4.25 to 4.35
	Chromium Molybdenum bars (0.50—0.70 Chrom., 0.15—0.25 Molyb.)	3.40 to 3.50
	Chromium Molybdenum spring steel (1 1.25 Chrom., 0.30 — 0.50 Molybdenum)	4.50 to 4.75

Above prices are for hot-rolled steel bars, forging quality. The ordinary differential for cold-drawn bars is 1c. per lb. higher. For billets 4 x 4 to 10 x 10 in. the price for a gross ton is the net price for bars of the same analysis. For billets under 4 x 4 in. down to and including 2½-in. squares, the price is $5 a gross ton above the 4 x 4 billet price.

*Not S. A. E. specifications, but numbered by manufacturers to conform to S. A. E. system.

Rails

	Per Gross Ton
Standard, f.o.b. mill	$43.00
Light (from billets), f.o.b. mill	$35.00 to 36.00
Light (from rail steel), f.o.b. mill	33.00 to 34.00
Light (from billets), f.o.b. Ch'go mill	36.00 to 38.00

Track Equipment

(F.o.b. Mill)

	Base Per 100 Lb.
Spikes, ⅝ in. and larger	$2.80 to $3.10
Spikes, ½ in. and smaller	3.00 to 3.50
Spikes, boat and barge	3.25
Track bolts, all sizes	4.00 to 4.50
Tie plates, steel	2.25 to 2.35
Angle bars	2.75

Welded Pipe

Base Discounts f.o.b. Pittsburgh District and Lorain, Ohio, Mills

Butt Weld

Steel			Iron		
Inches	Black	Galv.	Inches	Black	Galv.
⅛	45	19½	¼ to ⅜	+11	+39
¼ to ⅜	51	25½	½	22	2
½	56	42½	¾	28	11
¾	60	48½	1 to 1½	30	12
1 to 3	62	50½			

Lap Weld

2	55	43½	2	23	7
2½ to 6	59	47½	2½	26	11
7 and 8	56	43½	3 to 6	28	13
9 and 10	54	41½	7 to 12	26	11
11 and 12	53	40½			

Butt Weld, extra strong, plain ends

⅛	41	24½	¼ to ⅜	+19	+54
¼ to ⅜	47	30½	½	21	7
½	53	42½	¾	28	12
¾	58	47½	1 to 1½	30	14
1 to 1½	60	49½			
2 to 3	61	50½			

Lap Weld, extra strong, plain ends

2	53	42½	2	23	9
2½ to 4	57	46½	2½ to 4	29	15
4½ to 6	56	45½	4½ to 6	28	14
7 to 8	52	39½	7 to 8	21	7
9 and 10	45	32½	9 to 12	16	2
11 and 12	44	31½			

To the large jobbing trade the above discounts on steel pipe are increased on black by one point, with supplementary discount of 5%, and on galvanized by 1½ points, with supplementary discount of 5%. On iron pipe, both black and galvanized, the above discounts are increased to large jobbers by one point with supplementary discounts of 5 and 2½%.

Note.—Chicago district mills have a base two points less than the above discounts. Chicago delivered base is 2½ points less. Freight is figured from Pittsburgh, Lorain, Ohio, and Chicago district mills, the billing being from the point producing the lowest price to destination.

Boiler Tubes

Base Discounts f.o.b. Pittsburgh

Lap Welded Steel		Charcoal Iron	
2 to 2¼ in.	27	1½ in.	+18
2½ to 2¾ in.	37	1⅝ to 1⅞ in.	+ 8
3 in.	40	2 to 2¼ in.	— 2
3¼ to 3¾ in.	42½	2½ to 3 in.	— 7
4 to 13 in.	46	3¼ to 4½ in.	— 9

Beyond the above discounts, 5 to 7 fives extra are given on lap welded steel tubes and 2 to 3 tens on charcoal iron tubes.

Standard Commercial Seamless Boiler Tubes

Cold Drawn

1 in.	60	3 in.	45
1¼ to 1½ in.	52	3¼ to 3½ in.	47
1⅝ in.	36	4 in.	50
2 to 2¼ in.	31	4½, 5 and 6 in.	45
2½ to 2¾ in.	39		

Hot Rolled

2 and 2¼ in.	34	3¼ and 3½ in.	50
2½ and 2¾ in.	42	4 in.	53
3 in.	48	4½, 5 and 6 in.	48

Less carloads, 4 points less. Add $8 per net ton for more than four gages heavier than standard. No extra for lengths up to and including 24 ft. Sizes smaller than 1 in. and lighter than standard gage to be held at mechanical tube list and discount. Intermediate sizes and gages not listed take price of next larger outside diameter and heavier gage.

Seamless Mechanical Tubing

	Per Cent Off List
Carbon, 0.10% to 0.30%, base	50 to 55
Carbon, 0.30% to 0.40%, base	45 to 50

Plus differentials for lengths over 18 ft. and for commercially exact lengths. Warehouse discounts on small lots are less than the above.

Pa., an 8-mill unit which has been idle for more than two years.

Cold-Finished Steel Bars and Shafting.—Specifications against contracts show some increase, and the general outlook is brighter because the gain has come chiefly from the automobile parts makers. Those serving all save one large motor car builder are taking more steel. As is true of many other lines, current demand is a measure of consumption, since there is no evidence of large stocks in second hands and there is little buying for delivery beyond 30 to 45 days. The price still is 2.50c., base Pittsburgh, on the ordinary tonnages, with an extra of 10c. per 100 lb. on shipments of less than 24,000 lb.

Steel and Iron Bars.—Mills here and in Youngstown are naming 2.10c., base Pittsburgh, on small tonnage business for either spot or second quarter shipment. Some business is being placed at that figure, but 2c. still measures the prevailing price on ordinary tonnages. Specifications are steady enough but are not for very extended delivery. Fairly numerous small-lot orders for concrete bars are being placed, with 2c. the ruling figure, and occasional sales are bringing as high as 2.10c. Iron bars are steady at recent prices, with the demand fair. Prices are given on page 793.

Structural Steel.—There is no quotable change in prices, the market still holding at 1.90c. to 2c., base, on large structural shapes, depending on the size of the order. Mills would like to make 2c. the minimum, but conditions hardly are strong enough to sustain that price on large tonnages. This immediate district is not providing much business for the fabricating shops.

Plates.—The market here holds at 1.85c. to 1.90c., base Pittsburgh, but these prices usually refer to what are classed as ordinary tonnages. The market derives such firmness as it has, more from the lack of profit in present prices than because the demand is really large.

Hot-Rolled Flats.—The market is firm at 2.30c., base Pittsburgh, for stock 6 in. and wider, and at 2.50c., for narrower material. Demands are steady enough but generally call for prompt delivery, and few mills are able to accumulate backlogs. The best market at the moment seems to be in very narrow light-gage material.

Cold-Rolled Strips.—Most makers are holding firmly to 3.90c., base Pittsburgh or Cleveland, and that continues to be the ruling price, although on especially attractive business in the Detroit district and in New York a price of 3.75c. base, is reported.

Bolts, Nuts and Rivets.—Bolt and nut makers report a more confident demand than has been noted since 1923. Some irregularity still is observed in rivet prices, but most makers are holding firmly to $2.60 base per 100 lb. for large rivets. Prices and discounts are given on page 795.

Coke and Coal.—Evidently the curtailment of Connellsville coke production has not yet been sufficient to bring about a balance between supply and demand, and prices are softer. Spot tonnages of standard furnace coke are now readily available at $3 per net ton at ovens, and while as much as $3.25 is being paid, not much tonnage is involved. Spot foundry coke is $4.50 to $5 on good brands, with $5.50 for special brands. Blast furnace operators continue to defer placing their second quarter coke requirements, and it begins to look as though prices for that period would be nearer $3 than $3.50, at which producers are aiming. There is no market for coke for domestic use, and the Connellsville operators again are largely dependent on the blast furnaces and foundries for an outlet. Many settlements lately have been effected in the East on coke shipments that arrived after the hard coal strike had been settled. The usual settlement price is $5 per ton against purchases that carried prices ranging from $10 to $13 at Connellsville ovens. Slack coal is rather scarce and firm, but the coal market generally is dull and easy. Prices are given on page 795.

Old Material.—The market is weaker on open-hearth scrap. While one sale of 3500 tons of heavy melting steel was made to a Pittsburgh district melter at $18, that is not only the maximum, but also an extreme price. Against this have been definite offerings by dealers at $17.50, with no takers, and $17 the top bid that can be obtained from some consumers. The year's business to date in the steel works grades in this district has not amounted to more than 50,000 tons, a tonnage often moved in one month, and there are few, if any, mills that are badly in need of supplies. Meanwhile, with spring approaching and already more scrap offered than there is an outlet for, there is anxiety on the part of dealers for orders. There is no activity in the foundry grades.

We quote for delivery to consumer's mill in the Pittsburgh and other districts taking the Pittsburgh freight rate as follows:

	Per Gross Ton
Heavy melting steel	$17.50 to $18.00
No. 1 cast, cupola size	17.00 to 17.50
Rails for rolling, Newark and Cambridge, Ohio; Cumberland, Md.; Huntington, W. Va., and Franklin, Pa.	19.00 to 19.50
Compressed sheet steel	15.50 to 16.00
Bundled sheets, sides and ends	14.50 to 15.00
Railroad knuckles and couplers	20.50 to 21.00
Railroad coil and leaf springs	20.00 to 20.50
Low phosphorus blooms and billet ends	22.00 to 22.50
Low phosphorus plates and other material	19.50 to 20.00
Low phosphorus punchings	19.50 to 20.00
Steel car axles	22.00 to 23.00
Cast iron wheels	18.00 to 18.50
Rolled steel wheels	20.00 to 20.50
Machine shop turnings	13.50
Short shoveling turnings	13.50
Sheet bar crops	20.00 to 20.50
Heavy steel axle turnings	16.00 to 16.50
Short mixed borings and turnings	13.50
Heavy breakable cast	15.00 to 15.50
Cast iron borings	13.50
No. 1 railroad wrought	13.00 to 13.50
No. 2 railroad wrought	17.50 to 18.00

Increased Bookings of Fabricated Plate Work

WASHINGTON, March 16.—Reflecting a substantial increase, bookings of fabricated plate in February amounted to 29,731 tons, as against 24,467 tons in January, according to reports received by the Department of Commerce. The February bookings were based on reports from 36 firms, operations being at the rate of 44 per cent of capacity as against 36 per cent in January. Of the February bookings, 7122 tons were for oil storage tanks; 2172 tons for refinery materials and equipment; 5579 tons for tanks cars; 4068 tons for gas holders; 806 tons for blast furnaces and 9984 tons for stacks and miscellaneous purposes.

New Furnace to Go In

The Hudson Valley Coke & Products Co. expects to blow in its new furnace at Troy, N. Y., March 25. The stack, which was recently completed on the site of the former furnace of the Burden Iron Co., will have a capacity of 500 tons a day and will use coke from the Hudson company's own by-product plant, consisting of 55 ovens. The furnace will smelt American ores exclusively, including both Lake and Eastern ores. Foundry and malleable iron, and possibly some basic iron, will be produced.

Testing Society's First Edgar Marburg Lecturer Chosen

The first Edgar Marburg lecturer before the American Society for Testing Materials, as selected by the executive committee, will be Arthur N. Talbot, professor in charge of theoretical and applied mechanics, University of Illinois, Urbana, Ill. Professor Talbot is an honorary member and a past president of the society. He served as vice-president from 1912 to 1913 and as president from 1913 to 1914. He was made an honorary member in June, 1923.

Papers which have been accepted for the twenty-ninth annual meeting of the society, to be held at Chalfonte-Haddon Hall, Atlantic City, N. J., June 21 to 25, are announced as of extreme interest, including, so far as metals are concerned, papers on fatigue, on corrosion and on the testing of metals at high temperatures.

During 1925 513 new members were added, as compared with 452 in 1924 and 532 in 1923.

Semi-Finished Steel, Raw Materials, Bolts and Rivets

Semi-Finished Steel

F.o.b. Pittsburgh or Youngstown

Billets and Blooms

	Per Gross Ton
Rolling, 4-in. and over	$35.00
Rolling, 2-in. and smaller	36.00
Forging, ordinary	40.00
Forging, guaranteed	45.00

Sheet Bars

	Per Gross Ton
Open-hearth or Bessemer	$36.00

Slabs

	Per Gross Ton
8 in. x 2 in. and larger	$35.00
6 in. x 2 in. and smaller	36.00

Skelp

	Per Lb.
Grooved	1.90c.
Sheared	1.90c.
Universal	1.90c.

Wire Rods

	Per Gross Ton
*Common soft, base, No. 5 to ⅝-in.	$45.00
Common soft, coarser than ⅝-in.	$2.50 over base
Screw stock	$5.00 per ton over base
Carbon 0.20% to 0.40%	3.00 per ton over base
Carbon 0.41% to 0.55%	5.00 per ton over base
Carbon 0.56% to 0.75%	7.50 per ton over base
Carbon over 0.75%	10.00 per ton over base
Acid	15.00 per ton over base

*Chicago mill base is $46. Cleveland mill base, $45.

Raw Materials

Ores

Lake Superior Ores, Delivered Lower Lake Ports

	Per Gross Ton
Old range Bessemer, 51.50% iron	$4.55
Old range non-Bessemer, 51.50% iron	4.40
Mesabi Bessemer, 51.50% iron	4.40
Mesabi non-Bessemer, 51.50% iron	4.25
High phosphorus, 51.50% iron	4.15

Foreign Ore, c.i.f. Philadelphia or Baltimore

	Per Unit
Iron ore, low phos., copper free, 55 to 58% iron in dry Spanish or Algerian	9.50c. to 10c.
Iron ore, Swedish, average 66% iron	9.50c.
Manganese ore, washed, 51% manganese, from the Caucasus	45c.
Manganese ore, Brazilian or Indian, nominal	42c. to 44c.
Tungsten ore, high grade, per unit, in 60% concentrates	$12.50 to $14.00
	Per Ton
Chrome ore, Indian basic, 48% Cr_2O_3, crude, c.i.f. Atlantic seaboard	$22.00 to $23.00
	Per Lb.
Molybdenum ore, 85% concentrates of MoS_2, delivered	55c. to 60c.

Coke

	Per Net Ton
Furnace, f.o.b. Connellsville prompt	$3.00 to $3.25
Foundry, f.o.b. Connellsville prompt	4.50 to 5.50
Foundry, by-product, Ch'go ovens	10.50
Foundry, by-product, New England, del'd	13.00
Foundry, by-product, Newark or Jersey City, delivered	11.52
Foundry, Birmingham	5.50
Foundry, by-product, St. Louis or Granite City	10.00

Coal

	Per Net Ton
Mine run steam coal, f.o.b. W. Pa. mines	$1.50 to $2.00
Mine run coking coal, f.o.b. W. Pa. mines	1.90 to 2.25
Mine run gas coal, f.o.b. W. Pa. mines	1.90 to 2.15
Steam slack, f.o.b. W. Pa. mines	1.30 to 1.40
Gas slack, f.o.b. W. Pa. mines	1.40 to 1.50

Ferromanganese

	Per Gross Ton
Domestic, 80%, furnace or seab'd	$95.00
Foreign, 80%, Atlantic or Gulf port, duty paid	$95.00 to 110.00

Spiegeleisen

	Per Gross Ton Furnace
Domestic, 19 to 21%	$32.00 to $34.00
Domestic, 16 to 19%	31.00 to 33.00

Electric Ferrosilicon

	Per Gross Ton Delivered
50%	$85.00
75%	145.00

	Per Gross Ton Furnace		*Per Gross Ton Furnace*
10%	$42.00	12%	$42.00
11%	42.00	14 to 16%	$45 to 46.00

Bessemer Ferrosilicon

F.o.b. Jackson County, Ohio, Furnace

	Per Gross Ton		*Per Gross Ton*
10%	$36.00	12%	$40.00
11%	38.00		

Silvery Iron

F.o.b. Jackson County, Ohio, Furnace

	Per Gross Ton		*Per Gross Ton*
6%	$28.50	10%	$34.00
7%	29.50	11%	36.00
8%	30.50	12%	38.00
9%	32.00		

Other Ferroalloys

Ferrotungsten, per lb. contained metal, del'd	$1.15 to $1.20
Ferrochromium, 4% carbon and up, 60 to 70% Cr., per lb. contained Cr. delivered	11.50c.
Ferrovanadium, per lb. contained vanadium, f.o.b. furnace	$3.25 to $4.00
Ferrocarbontitanium, 15 to 18%, per net ton, f.o.b. furnace, in carloads	$200.00
Ferrophosphorus, electric or blast furnace material, in carloads, 18%, Rockdale, Tenn., base, per net ton	$91.00
Ferrophosphorus, electric, 24%, f.o.b. Anniston, Ala., per net ton	$122.50

Fluxes and Refractories

Fluorspar

	Per Net Ton
Domestic, 85% and over calcium fluoride, not over 5% silica, gravel, f.o.b. Illinois and Kentucky mines	$18.00
No. 2 lump, Illinois and Kentucky mines	$20.00
Foreign, 85% calcium fluoride, not over 5% silica, c.i.f. Atlantic port, duty paid,	$16.60 to $17.06
Domestic, No. 1 ground bulk, 95 to 98% calcium fluoride, not over 2½% silica, f.o.b. Illinois and Kentucky mines	$32.50

Fire Clay

	Per 1000 f.o.b. Works	
	High Duty	Moderate Duty
Pennsylvania	$43.00 to $46.00	$40.00 to $43.00
Maryland	48.00 to 50.00	43.00 to 45.00
Ohio	43.00 to 46.00	40.00 to 43.00
Kentucky	43.00 to 45.00	40.00 to 43.00
Illinois	43.00 to 45.00	40.00 to 43.00
Missouri	40.00 to 43.00	35.00 to 38.00
Ground fire clay, per ton	6.50 to 7.50	

Silica Brick

	Per 1000 f.o.b. Works
Pennsylvania	$40.00
Chicago	49.00
Birmingham	54.00
Silica clay, per ton	$8.00 to 9.00

Magnesite Brick

	Per Net Ton
Standard size, f.o.b. Baltimore and Chester, Pa.	$65.00
Grain magnesite, f.o.b. Baltimore and Chester, Pa.	40.00

Chrome Brick

	Per Net Ton
Standard size	$48.00

Bolts, Nuts, Rivets and Set Screws

Bolts and Nuts

(Less-than-Carload Lots)

(F.o.b. Pittsburgh, Cleveland, Birmingham and Chicago)

	Per Cent Off List
Machine bolts, small, rolled threads	60 and 10
Machine bolts, all sizes, cut threads	50, 10 and 10
Carriage bolts, smaller and shorter, rolled threads	50, 10 and 10
Carriage bolts, cut threads, all sizes	50 and 10
Eagle carriage bolts	65 and 10
Lag bolts	60, 10 and 10
Plow bolts, Nos. 3 and 7 heads (Extra of 20% for other style heads)	50 and 10
Machine bolts, c.p.c. and t. nuts, ⅜ x 4 in.	45, 10 and 5
Larger and longer sizes	45, 10 and 5
Bolt ends with hot-pressed nuts	50, 10 and 10
Bolt ends with cold-pressed nuts	45, 10 and 5
Hot-pressed nuts, blank and tapped, square	4.00c. off list
Hot-pressed nuts, blank or tapped, hexagons	4.40c. off list
C.p.c. and t. square or hex. nuts, blank or tapped	4.10c. off list
Washers*	6.50c. to 6.25c. off list

*F.o.b. Chicago and Pittsburgh.

The discount on machine, carriage and lag bolts is 5 per cent more than above for car lots. On hot-pressed and cold-punched nuts the discount is 25c. more per 100 lb. than quoted above for car lots.

Bolts and Nuts

(Quoted with actual freight allowed up to but not exceeding 50c. per 100 lb.)

	Per Cent Off List
Semi-finished hexagon nuts:	
⅞ in. and smaller, U. S. S.	80, 10 and 5
⅞ in. and larger, U. S. S.	75, 10 and 5
Small sizes, S. A. E.	80, 10, 10 and 5
S. A. E., ⅝ in. and larger	75, 10, 10 and 5
Stove bolts in packages	80, 10 and 5
Stove bolts in bulk	80, 10, 5 and 2½
Tire bolts	60 and 5

Semi-Finished Castellated and Slotted Nuts

(Actual freight allowed up to but not exceeding 50c. per 100 lb.)

(To jobbers and consumers in large quantities)

	Per 100 Net S.A.E.	U.S.S.		*Per 100 Net* S.A.E.	U.S.S.
¼-in.	$0.44	$0.44	⅝-in.	$2.35	$2.40
7/16-in.	0.515	0.515	¾-in.	3.60	3.60
⅜-in.	0.62	0.66	1-in.	5.65	5.80
7/16-in.	0.79	0.90	1¼-in.	8.90	8.90
½-in.	1.01	1.05	1¼-in.	12.60	13.10
9/16-in.	1.38	1.42	1⅜-in.	18.35	18.35
⅝-in.	1.70	1.73	1½-in.	21.00	21.60

Larger sizes.—Prices on application.

Large Rivets

	Base Per 100 Lb.
F.o.b. Pittsburgh	$2.50 to $2.60
F.o.b. Cleveland	2.70
F.o.b. Chicago	2.75

Small Rivets

	Per Cent Off List
F.o.b. Pittsburgh	70 and 10
F.o.b. Cleveland	70 and 10
F.o.b. Chicago	70 and 10 to 70 and 5

Cap and Set Screws

(Freight allowed up to but not exceeding 50c. per 100 lb.)

	Per Cent Off List
Milled cap screws	80 and 10
Milled standard set screws, case hardened,	80 and 5
Milled headless set screws, cut thread	80
Upset hex. head cap screws, U. S. S. thread,	80, 10 and 10
Upset hex. cap screws, S. A. E. thread,	80, 10 and 10
Upset set screws	80, 10 and 5
Milled studs	70 and 5

Chicago

Heavy Steel Specifications from Car Builders—Merchant Furnace Out

CHICAGO, March 16.—Railroad equipment purchases in the first two and one-half months of the year cover 26,500 cars, a number which has not been exceeded for the corresponding period in several years. This business has brought into the market nearly 270,000 tons of plates, shapes and bars, and 106,000 axles, a large share of which is being supplied by Western mills. Car material specifications received by local mills for the week exceeded 50,000 tons, and makers report that the Chicago district will participate heavily in 40,000 tons still pending. Little additional car business was booked by Western builders in the past week, and active inquiries open to this district do not exceed 2500 miscellaneous freight cars.

The outstanding plate inquiry for the week is 3000 tons for oil tanks at Houston, Tex. After two weeks of rather a brisk business in fabricated steel, the past seven days have been very quiet. With most rail and track accessory contracts placed mills find that new business for the week is about equal to shipments. At the moment, makers of finished steel can see no indication of increased buying in this territory but insist that if the current rate of general demand is sustained, mills can maintain their present rate of operations.

Due largely to activity upon the part of car builders, specifications are the heaviest in 14 weeks. Mills are being pressed at every turn for prompt delivery, indicating that buyers are not willing at this time to build up stocks but prefer to obligate themselves only to the extent of current consumption.

The number of active steel works blast furnaces remains at 29 out of 35 in the district. The merchant pig iron market has shown little improvement, and output has been reduced by the blowing out of the Thomas furnace on March 11.

Coke.—Shipments of by-product foundry coke are going forward at an unchanged rate, and the price remains $10.50, district ovens, or $11, delivered Chicago switching district.

Ferroalloys.—Domestic ferromanganese has dropped $5 and is now being quoted at $95, furnace or seaboard, or $102.56, delivered. The recent price decline has only served to convince buyers that this material has not reached bottom, and they are insisting that sellers incorporate price protective clauses for the remainder of the year in contracts now being offered. Sales are very light even under these conditions. Specifications in ferrosilicon are liberal, and a dealer reports the sale of two carloads of the 50 per cent grade at the full schedule of $85, delivered.

We quote 80 per cent ferromanganese, $102.56, delivered Chicago; 50 per cent ferrosilicon, $85, delivered; spiegeleisen, 18 to 22 per cent, $41.76, delivered Chicago.

Pig Iron.—Production in the Chicago district has been curtailed to the extent of 300 to 350 tons per day by the blowing out on March 11 of the Thomas furnace at Milwaukee. The lining of the furnace has now been in service off and on for about 21 months and the owners expect to make repairs and improvements which will result in a higher daily production. Active merchant stacks in this district now include two Federal, two Iroquois, one Mayville and the Zenith furnace. The merchant trade is still obtaining surplus iron from the Indiana Harbor plant of the Youngstown Sheet & Tube Co. Little change has taken place in the market, and current purchases are on the basis of $23, local furnace, for No. 2 foundry iron. Second quarter contracting is advancing slowly, but on the whole, users are determined to wait out the market by buying small tonnages from time to time to meet current needs. Makers report that prompt delivery demands are more insistent than at any time since last fall. Dealers have opened their books on silvery for second quarter at the prevailing schedule, but as in the case of foundry grades, users continue to buy from hand to mouth and appear uninterested in their forward requirements. A melter in the Chicago territory has taken 500 tons of low phosphorus iron at $31.20, this being for immediate delivery.

Quotation on Northern foundry, high phosphorus and malleable iron are f.o.b. local furnace, and do not include an average switching charge of 61c. per ton. Other prices are for iron delivered at consumers' yards.

Northern No. 2 foundry, sil. 1.75 to 2.25		$23.00
Northern No. 1 foundry, sil. 2.25 to 2.75		23.50
Malleable, not over 2.25 sil.		23.00
High phosphorus		23.00
Lake Superior charcoal, averaging sil. 1.50, delivered at Chicago		29.04
Southern No. 2 (all rail)	$27.01 to	28.01
Southern No. 2 (barge and rail)	26.18 to	27.18
Low phos., sil. 1 to 2 per cent, copper free	31.20 to	31.70
Silvery, sil. 8 per cent		35.29
Ferrosilicon, 14 to 16 per cent		48.79

Plates.—Freight cars ordered so far in 1926 total 26,500, which is a greater number than has been placed in the corresponding period for several years. As a result of this buying, close to 270,000 tons of plates, shapes and bars have been placed with mills throughout the country. Car material specifications received by local mills for the week exceeded 50,000 tons, and fully 40,000 tons in which Chicago mills will participate heavily is before the trade. Fewer cars are now on inquiry from Western roads than at any time since the first of the year. Makers of tanks on this district are not heavily booked and are forwarding light specifications to mills. A gas holder in Michigan will require 4500 tons of plates, and oil tanks for Houston, Tex., call for 3000 tons. In this district the mill quotation on plates is firm at 2.10c., Chicago, but keen competition southeast of here is resulting in price shading. Eastern mills entering the immediate Chicago district insist that they are maintaining a price of 1.80c., base Pittsburgh, or 2.14c., delivered Chicago.

The mill quotation is 2.10c., Chicago. Jobbers quote 3.10c. for plates out of stock.

Structural Material.—Following two weeks of activity structural bookings for the week are light. Although a fair number of contracts were awarded, they were individually small and do not bulk large in the aggregate. Architects are said to be busy and this leads mills to look for a heavy demand for structural material during the spring and early summer months. Fabricators continue the practice of specifying only for immediate requirements and are demanding prompt shipment from mills. It is generally believed that stocks of plain material at the shops are low and badly out of balance. Makers are holding steadily to the mill price of 2.10c., base Chicago, and Eastern producers shipping into this territory are quoting 1.90c., base Pittsburgh, or 2.24c., delivered Chicago, on average tonnages.

The mill quotation on plain material is 2.10c., Chicago. Jobbers quote 3.10c. for plain material out of warehouse.

Bars.—Makers of soft steel bars find that both inquiry and specifications for the current week show a decided improvement over the previous seven days. Sales are said to be in greater volume than at any time within the past month. This gain is largely due to greater activity on the part of the manufacturing trade, which is gradually setting a more rapid pace. Automobile makers, in particular, are speeding up production and are now aiming at record-breaking schedules. Automobile parts makers are also busy and are specifying freely. Local mills have opened their books for second quarter at an unchanged price of 2.10c., Chicago. Eastern competition is not a factor in the immediate Chicago territory, but is having its effect in lower prices in the district surrounding Indianapolis. The demand for bar iron is gradually improving, and mills now have better order books than for some time past. Current business is largely from the railroads, although some tonnage is coming from railway appliance manufacturers and farm implement makers. A Western car builder is inquiring for 750 tons. Bar iron is firm at 2c., Chicago. Demand for rail steel bars is easing off, and the price of 2c., Chicago, is not so firmly established as heretofore. Specifications for fence posts, which are being shipped large-

ly from mill stocks, are still heavy, but the demand for reinforcing bars and from bed manufacturers is light.

Mill prices are: Mild steel bars, 2.10c., Chicago; common bar iron, 2c., Chicago; rail steel bars, 2c., Chicago.

Jobbers quote 3c. for steel bars out of warehouse. The warehouse quotations on cold-rolled steel bars and shafting are 3.60c. for rounds and hexagons and 4.10c. for flats and squares; 4.15c. for hoops and 3.65c. for bands.

Jobbers quote hard and medium deformed steel bars at 2.60c., Chicago warehouse.

Wire Products.—Demand from the manufacturing trade is fairly active and second quarter contracts made to date are in good volume. The jobbing trade is quieter, but makers of wire products feel that this is a temporary situation brought about largely by the poor condition of country roads. The first two weeks in March have not measured up to the expectations of mills. In fact, they fell behind the corresponding period of last year. Mill operations are unchanged at 65 per cent of capacity. Mill prices are shown on page 793.

We quote warehouse prices f.o.b. Chicago: No. 8 black annealed wire, $3.30 per 100 lb.; common wire nails, $3.05 per keg; cement-coated nails, $2.05 to $2.20 per count keg.

Rails and Track Supplies.—The Nickel Plate is reported to have placed 15,750 tons of 90 and 100-lb. standard rail sections and the necessary accessories with the Illinois Steel Co., the Bethlehem Steel Co. and the Carnegie Steel Co. Otherwise, bookings for the week were light and, in addition to the above, included 3500 tons of joints and 5000 kegs of spikes and bolts. Steel tie plates are still quotable at 2.25c., f.o.b. mill. Rail mills continue to operate at capacity. A small tonnage of iron tie plates was purchased within the week, and makers report that specifications against contracts are liberal.

Standard Bessemer and open-hearth rails, $43; light rails, rolled from billets, $36 to $38 per gross ton, f.o.b. maker's mill.

Standard railroad spikes, 2.90c. to 3c., mill; track bolts with square nuts, 3.90c. to 4c. mill; steel tie plates, 2.25c., f.o.b. mill; angle bars, 2.75c., f.o.b. mill.

Jobbers quote standard spikes out of Chicago warehouse at 3.55c., base, and track bolts, 4.55c., base.

Reinforcing Bars.—Fresh inquiries continue to come in more rapidly than contracts are closed. Tonnage placed so far in March is light and does not equal the volume of business placed at this time last year. In general, inquiries and awards are small, and only here and there does one appear for 200 or 300 tons. Dealers, however, estimate that a total of close to 5000 tons is now pending. The Chicago & Western Indiana subway at Lawrence Avenue, Chicago, may require 1000 tons, and plans now under way for an addition to the Cook County Hospital, Chicago, will call for 800 tons. The Chicago warehouse price for billet steel reinforcing bars remains unchanged at 2.60c. New projects and recent awards are shown on page 806.

Cast Iron Pipe.—Inquiry is showing a decided upturn, and makers are busy figuring on a large number of attractive projects. Locally quotations are steady at $41 to $42, base Birmingham, or $49.20 to $50.20, delivered Chicago, for 6-in. and larger diameters. Evansville, Ind., closed for 400 tons of 4 to 8-in. Class C pipe with the National Cast Iron Pipe Co., whose bid was $41.50, base Birmingham. Both the American Cast Iron Pipe Co. and the United States Cast Iron Pipe & Foundry Co. bid $42. The low bid on 2000 tons of 6-in. and larger pipe for Duluth, Minn., is said to be $41.60, base Birmingham. The United States Cast Iron Pipe & Foundry Co. has booked 250 tons of 6 and 8-in. Class B pipe for Mundelein, Ill., and James B. Clow & Sons took 430 tons of 6 and 10-in. pipe for Evanston, Ill. Youngstown is reported to have split 1100 tons between the United States Cast Iron Pipe & Foundry Co. and the National Cast Iron Pipe Co. Midland, Mich., will receive tenders on March 23 on 240 tons of 14-in., 452 tons of 10-in. and 14 tons of 6-in., all Class B, and Akron, Ohio, will take bids on March 23 on 1000 tons of 4 to 16-in. pipe, 5 tons of 4-in. fittings and 45 tons of 6 to 16-in. fittings. Springfield, Ill., is asking prices on 50 tons of 6-in., 25 tons of 16-in. and 700 tons of 24-in. Class C pipe, and Toledo, Ohio, will open bids March 20 on 250 tons of 12-in. pipe. Warren, Ohio, will open bids this week on 386 tons of 4, 6 and 8-in. Class B, and Park Ridge, Ill., will this week place 2200 tons of 6, 8 and 12-in. Class B. Whitefish Bay, Wis., is inquiring for 250 tons of 6 and 8-in. Class B, and Lake Bluff, Ill., will take bids March 18 on 200 tons of 6, 8 and 10-in. pipe. Chicago is opening bids this week on 450 tons of 8 and 12-in. Class B. Milwaukee will close March 23 on 2280 tons of plain and 95 tons of lugged pipe and 72 tons of special castings, in 36, 48 and 54-in. diameters.

We quote per net ton, delivered Chicago, as follows: Water pipe, 4-in., $53.20 to $54.20; 6-in. and over, $49.20 to $50.20; Class A and gas pipe, $4 extra.

Bolts, Nuts and Rivets.—Makers find little or no resistance to the signing of second quarter contracts at unchanged prices. Current specifications are heavy, and the rate of production is on the up grade, now being between 75 and 80 per cent of capacity.

Jobbers quote structural rivets, 3.50c. per lb.; boiler rivets, 3.70c. per lb.; machine bolts up to ⅞ x 4 in., 50 and 5 per cent off; larger sizes, 50 and 5 off, carriage bolts up to ⅞ x 4, 47½ off; larger sizes, 47½ off; hot-pressed nuts, square, tapped or blank, $3.25 off; hot-pressed nuts, hexagons, tapped or blank, $3.75 off; coach or lag screws, 55 and 5 per cent off.

Cold-Rolled Bars.—Mills have opened books for the second quarter at an unchanged price of 2.50c., base, per lb., f.o.b. Chicago.

Sheets.—Both specifications and orders are approximately equal to shipments, and mills continue to operate at close to capacity. Makers are operating with an average backlog of four weeks on all products, although it is admitted that the schedule for blue annealed sheets is much heavier than for either galvanized or black.

Chicago delivered prices from mill are 3.50c. for No. 28 black, 2.65c. for No. 10 blue annealed and 4.75c. for No. 28 galvanized. Delivered prices at other Western points are equal to the freight from Gary plus the mill prices, which are 5c. per 100 lb. lower than the Chicago delivered prices.

Jobbers quote f.o.b. Chicago: 3.50c. base for blue annealed, 4.10c. base for black, and 5.25c. base for galvanized.

Old Material.—This market is still very quiet, and although a little inquiry appears here and there and a few small tonnage sales are made from day to day, the supply of available material is more than ample to meet all requirements and prices remain weak. A large user who has been offering $14.25 for heavy melting steel has bought about 2000 tons at that price and specified delivery over the next 60 days. A steel mill has purchased a small tonnage of cast iron borings at $12.25 per gross ton, delivered. This grade is rather scarce and dealers are trading it at $12.

We quote delivered in consumers' yards, Chicago and vicinity, all freight and transfer charges paid for all items except relaying rails, including angle bars to match, which are quoted f.o.b. dealers' yards:

Per Gross Ton	
Heavy melting steel	$14.00 to $14.25
Frogs, switches and guards, cut apart, and miscellaneous rails	15.25 to 15.75
Shoveling steel	13.75 to 14.00
Hydraulic compressed sheets	12.00 to 12.50
Drop forge flashings	11.00 to 11.50
Forged, cast and rolled steel car wheels	18.25 to 18.75
Railroad tires, charging box size	18.25 to 18.75
Railroad leaf springs, cut apart	18.25 to 18.75
Steel couplers and knuckles	16.50 to 17.00
Coil springs	19.00 to 19.50
Low phos. punchings	17.50 to 18.00
Axle turnings	15.25 to 15.75
Relaying rails, 56 lb. to 60 lb.	25.00 to 26.00
Relaying rails, 65 lb. and heavier	26.00 to 31.00
Rerolling rails	16.50 to 17.00
Steel rails, less than 3 ft	17.50 to 18.00
Iron rails	16.50 to 17.00
Cast iron borings	11.75 to 12.25
Short shoveling turnings	11.75 to 12.25
Machine shop turnings	8.75 to 9.25
Railroad malleable	17.50 to 18.00
Agricultural malleable	16.50 to 17.00
Angle bars, steel	16.50 to 17.00
Cast iron car wheels	17.00 to 17.50
Per Net Ton	
No. 1 machinery cast	17.00 to 17.50
No. 1 railroad cast	15.75 to 16.25
No. 1 agricultural cast	15.75 to 16.25
Stove plate	13.75 to 14.25
Grate bars	13.25 to 13.75
Brake shoes	12.50 to 13.00
Iron angle and splice bars	15.75 to 16.25
Iron arch bars and transoms	20.50 to 21.00
Iron car axles	25.00 to 25.50
Steel car axles	17.50 to 18.00
No. 1 railroad wrought	13.00 to 13.50
No. 2 railroad wrought	12.25 to 12.75
No. 1 busheling	11.25 to 11.75
No. 2 busheling	7.75 to 8.25
Locomotive tires, smooth	16.50 to 17.00
Pipes and flues	10.00 to 10.50

Birmingham

Season Brings Heavier Pipe Demand—Pig Iron Bookings Accumulate

BIRMINGHAM, March 16.—Sales of pig iron from day to day are building up aggregate bookings, and with some of the larger melters sounding out the market, it is possible that the end of the month will see furnaces committed for a considerable portion of their probable make in the second quarter. Alabama producers still see every warrant for maintaining a high rate of production. Fourteen blast furnaces continue to make foundry iron, less than 35,000 tons of which is on their yards. Recently certain spot orders were placed with difficulty because of specifications. Current inquiries indicate not only that the larger melters but those who buy steadily will have purchased additional iron for second quarter. A survey of iron consumption in this district shows either sustained or increased melt. Especially is this true of cast iron pressure pipe makers, who ship as fast as they produce. Minor accidents at blast furnaces during the past week, though attended by loss of property and in one instance by loss of lives, did not interfere with pig iron output. Production of foundry iron, however, has not increased in March, as was anticipated. Basic iron output is in keeping with the demands of the open-hearth furnaces in this district, practically all of which are in operation.

We quote per gross ton, f.o.b. Birmingham district furnaces, as follows:

No. 2 foundry, 1.75 to 2.25 sil...	$22.00
No. 1 foundry, 2.25 to 2.75 sil...	22.50
Basic	22.00
Charcoal, warm blast	$30.00 to 32.00

Rolled Steel.—Local demands are taking care of the output of the smaller fabricating plants, while the larger shops are finding a splendid market in adjoining States and even further afield. Steel Corporation mills are producing at a steady pace, some of them running at full capacity. A new bar mill of Gulf States Steel Co. at Gadsden, Ala., will be placed in operation April 1. With this mill running it is probable that the company will operate all six of its open-hearth furnaces. New orders for freight cars taken by the Fairfield works of the Tennessee Coal, Iron & Railroad Co. will require considerable steel. Steel bars from mill are holding at 2.15c. to 2.25c., base Birmingham; structural shapes at 2.05c. to 2.15c., and plates at 1.95c. to 2.05c. A local tie, band and hoop mill has received further shipments of French billets.

Cast Iron Pipe.—Spring business has set in with the pressure pipe makers in the Birmingham district, and as weather conditions improve in various parts of the country, demands for deliveries are expected to grow still heavier. All four of the producers of pressure pipe in this State are feeling the effects of a more active market. New business includes substantial tonnages from the Middle West. An increase in production by April 15 is now assured.

Coke.—Quotations on coke are firm at $5.50 per ton, Birmingham, with some business bringing as high as $6. Production and shipments continue steady, and demand has not shown any great recession. In fact, it is believed the coke market will be active for at least three months longer. Local consumption has increased slightly, and there is pressure for deliveries. All by-product coke plants in this district are in operation.

Old Material.—Market activity is confined to deliveries on old contracts. New business is rather slow. Prices, however, are steady.

We quote per gross ton, f.o.b. Birmingham district yards, as follows:

Cast iron borings, chemical	$15.00 to $16.00
Heavy melting steel	13.00 to 14.00
Railroad wrought	12.00 to 13.00
Steel axles	19.00 to 20.00
Iron axles	18.00 to 19.00
Steel rails	14.00 to 14.50
No. 1 cast	17.00 to 17.50
Tramcar wheels	17.00 to 17.50
Car wheels	16.00 to 16.50
Stove plate	14.00 to 14.50
Machine shop turnings	8.00 to 8.50
Cast iron borings	8.00 to 9.00
Rails for rolling	15.00 to 16.00

Seattle

Maintained Demand for Steel but Pig Iron Slow—Ship Inquiries

SEATTLE, March 12.—More new business is being taken and more inquiries in sight than at any time this year. New building work promises to break all former records. Two large motion picture theaters and a hotel are to be built here this year, and the Western railroads are expected this year to replace many small bridges.

Pig Iron.—Not much is doing in pig iron. The foundries are running not more than 50 per cent of capacity, and the Pacific Coast Steel Co. uses upward of 90 per cent scrap in its open-hearth furnaces. The Utah interest is quoting $26 to $27, delivered, for both basic and foundry grades.

Finished Steel.—Some transmission towers are being figured on that will take about 500 tons of light shapes. Beams and channels are reported firm at 2.35c., delivered here. The Beall Tank & Pipe Co., Portland, has taken 3500 tons of plates for a water line at Medford, Ore., and the Willamette Iron & Steel Works, Portland, 300 to 400 tons of lock bar pipe for a 52-in. water line at Tacoma. Bids open March 15 for a like size job at Tacoma. Tacoma is gradually replacing old wooden water lines with steel, and will be a buyer of steel pipe over the next year or two. Plates are fairly firm at 2.30c., Seattle. The California maker of wire products has an all rail freight of 27c. to Portland and a correspondingly low rate to Seattle, and it is likely that the Eastern mills will have to meet the California competition to hold their trade in these two districts. The rate from the Colorado mill to Portland is 77c., while the rail and water rate from Pittsburgh is about 65c., including insurance and freight. Consumption of wire nails on the Pacific Coast is steadily increasing, owing to the active building operations. Wire nails are quoted at $3.20 to $3.25, plain wire at 3c. to 3.05c., and galvanized at about 3.75c., delivered. Steel bars are held at 2.35c., and this price could be shaded only on a very desirable order. Reinforcing bars are 2.75c. to 2.85c., and the market is quite firm. Orders are in sight for 3000 to 4000 tons, with considerable more tonnage having been placed in the last two weeks.

Ship Construction.—The Southern Pacific Steamship Co., San Francisco, has issued specifications covering the building of one to three combination passenger and freight carriers. The ships will each have an over all length of 445 ft. and beam of 60 ft. The Inter-Island Steam Navigation Co., Limited, Honolulu, will also build a passenger and freight boat designed by Gibbs Brothers, New York. The boat is to be 400 ft. in length over all and 60 ft. of beam.

Toronto

Newfoundland Ore Contract Renewed—Mills Have Rail Business

TORONTO, ONT., March 15.—The Newfoundland government is renewing its contract with the British Empire Steel Corporation, which allows the latter to mine iron ore on Belle Isle. The terms have not yet been made public, but it is understood that the contract will extend preference in the matter of export duties to places within the British Empire. For some time past the corporation has been shipping large tonnages of iron ore to Germany, and it is expected that contracts from that country will be also renewed.

The rail mill of the British Empire Steel Corporation, Sydney, N. S., which has been working on Canadian National Railways rail orders, has adjusted its rolls to the requirements of the New Zealand railroads, and is now rolling the last 7000 tons of a 10,000-ton order on that account. This will keep the mills running on single shift until the middle of April.

It is reported from the general offices of the Algoma Steel Corporation, Sault Ste. Marie, Ont., that its rail mill will start up about the first of April. The starting up of the rail mill will mean the blowing in of one or two blast furnaces to supply basic iron for steel making. Officials of the corporation are not prepared to make any statement regarding the amount of business on its books, although it was reported last November when the rail mill shut down that there was an order standing for 35,000 tons of steel rails from the Canadian National Railways for delivery early this spring. Other orders of a diversified nature are said to have been booked since the first of the year, and it is generally believed that most departments of the Soo steel works will shortly be in operation.

St. Louis

First Quarter Pig Iron Will Cover Large Part of Second Quarter Needs

ST. LOUIS, March 16.—First quarter purchases of pig iron by melters in this district apparently have been of sufficient size to cover second quarter requirements for the most part. The result has been very little buying for the next quarter, and there is absolutely no interest yet in third quarter iron. The apathy of melters has been accentuated by a letter sent out by a Southern maker advising them not to buy now as "prices may be more attractive a little later on." The St. Louis Coke & Iron Corporation sold 500 to 600 tons of foundry iron in small lots for prompt and second quarter shipment, and inquiries from five northern Illinois melters total 1500 to 2000 tons. The market is nominally unchanged.

We quote delivered consumers' yards, St. Louis, as follows, having added to furnace prices, $2.16 freight from Chicago, $4.42 from Birmingham, all rail, and 81c. average switching charge from Granite City:

Northern fdy., sil. 1.75 to 2.25	$25.16
Northern malleable, sil. 1.75 to 2.25	25.16
Basic	25.16
Southern fdy., sil. 1.75 to 2.25	$26.42 to 27.92
Granite City iron, sil. 1.75 to 2.25	24.31 to 24.81

Ferroalloys.—The reduction of $15 a ton on ferromanganese proved attractive to some consumers in the district. Several hundred tons were sold at the lower price.

Finished Iron and Steel.—Business generally is quiet. The only railroad inquiry pending is one from the Missouri-Kansas-Texas for its second quarter requirements in tank plates. Most structural fabricators in the district are in need of business. A number of projects are now in sight, but it will be some time before they reach the stage when bids will be asked. Reinforcing bar business is also dull.

For stock out of warehouse we quote: Soft steel bars, 3.15c. per lb.; iron bars, 3.15c.; structural shapes, 3.25c.; tank plates, 3.25c.; No. 10 blue annealed sheets, 3.60c.; No. 28 black sheets, cold rolled, one pass, 4.60c.; galvanized sheets, No. 28, 5.70c.; black corrugated sheets, 4.65c.; galvanized, 5.75c.; cold-rolled rounds, shafting and screw stock, 3.75c.; structural rivets, 3.65c.; boiler rivets, 3.85c.; tank rivets, ⅞-in. diameter and smaller, 70 per cent off list; machine bolts, 55 per cent; carriage bolts, 50 and 5 per cent; lag screws, 55½ per cent; hot-pressed nuts, square, $3.25 off list; hexagon, blank or tapped, $3.75 off list.

Coke.—The principal transaction of the week was the sale of 300 to 500 tons of foundry coke by the St. Louis Coke & Iron Corporation for prompt shipment. The demand for domestic grades has declined, although it is still much heavier than it was expected to be following the settlement of the anthracite strike.

Old Material.—The market for old material is weak because of heavy offerings by the railroads and the failure of consumers to place orders. Consumers say they have no forward business, and must have still lower prices on materials. Prices are unchanged. Railroad lists include: Chesapeake & Ohio, 10,500 tons; Southern Railway, 7800 tons; Rock Island Lines, 7200 tons; International-Great Northern, 6500 tons; Atchison, Topeka & Santa Fe, 2800 tons; Texas & Pacific, 2000 tons, and Mobile & Ohio, 1200 tons.

We quote dealers' prices f.o.b. consumers' works, St. Louis industrial district and dealers' yards, as follows:

Per Gross Ton		
Iron rails	$13.00 to	$13.50
Rails for rolling	16.00 to	16.50
Steel rails less than 3 ft	17.00 to	17.50
Relaying rails, 60 lb. and under	24.00 to	25.00
Relaying rails, 70 lb. and over	30.00 to	31.00
Cast iron car wheels	17.25 to	17.75
Heavy melting steel	14.00 to	14.50
Heavy shoveling steel	14.00 to	14.50
Frogs, switches and guards cut apart	15.00 to	15.50
Railroad springs	17.25 to	17.75
Heavy axle and tire turnings	11.00 to	11.50
No. 1 locomotive tires	16.50 to	17.00
Per Net Ton		
Steel angle bars	12.50 to	13.00
Steel car axles	17.75 to	18.25
Iron car axles	22.50 to	23.00
Wrought iron bars and transoms	19.50 to	20.00
No. 1 railroad wrought	11.50 to	12.00
No. 2 railroad wrought	12.50 to	13.00
Cast iron borings	9.50 to	10.00
No. 1 busheling	10.50 to	11.00
No. 1 railroad cast	14.75 to	15.25
No. 1 machinery cast	16.50 to	17.00
Railroad malleable	13.50 to	14.00
Machine shop turnings	6.75 to	7.25
Bundled sheets	7.50 to	8.00

Boston

Foreign Pig Iron Offerings Less Pressing —Plate Demand More Active

BOSTON, March 16.—Offerings of foreign irons are less urgent and prices display more stability, although they are still attractive on a delivered basis as compared with those for domestic irons. It is reported that Dutch furnaces have changed from foundry to steel iron, that French furnace prices are firmer, and that English furnaces are talking higher prices because of the coal situation in that country. German furnace prices are still unsettled. On the other hand, German No. 2X iron is now generally quoted here at $21, on dock duty paid, as against $20.50 and less the first of the month. English No. 2X foundry sold the past week at $21, on dock duty paid, and No. 1X at $21.50 and $22. It is said foreign iron stored at Providence, R. I., is to be cleaned up this month and the port abandoned as a point of distribution. A Springfield, Mass., foundry is said to have purchased 1000 tons of No. 2X eastern Pennsylvania iron at $22.50 furnace, or $26.15 delivered, and an equal amount of foreign iron, in two lots, at somewhat lower delivered prices for March, April and May delivery. Otherwise sales reported were small and about equally divided between domestic and foreign iron. Some falling off in Connecticut foundry activities has brought the total New England weekly melt well under the February average.

We quote delivered prices on the basis of the latest sales as follows, having added $3.65 freight from eastern Pennsylvania, $4.91 from Buffalo, $5.93 from Virginia, and $9.60 from Alabama:

East. Penn., sil. 1.75 to 2.25	$25.65 to	$26.15
East. Penn., sil. 2.25 to 2.75	26.15 to	26.65
Buffalo, sil. 1.75 to 2.25		25.91
Buffalo, sil. 2.25 to 2.75		26.41
Virginia, sil. 1.75 to 2.25		29.92
Virginia, sil. 2.25 to 2.75		30.42
Alabama, sil. 1.75 to 2.25	31.60 to	32.60
Alabama, sil. 2.25 to 2.75	32.10 to	33.10

Cast Iron Pipe.—Hartford, Conn., has awarded 800 tons of 6-in. to 30-in. pipe to the United States Cast Iron Pipe & Foundry Co., and Waterbury, Conn., has placed 750 tons of 6-in. and 8-in. pipe with R. D. Wood & Co. French pipe interests were low bidders on 600 tons of 6-in. to 12-in. pipe readvertised by Medford, Mass., but the city awarded the contract to the United States Cast Iron Pipe & Foundry Co. Holyoke, Mass., will open bids March 19 on 6000 tons of 6-in. to 20-in. pipe. Quincy, Mass., will open bids March 25 on 3805 tons of 6-in. to 20-in. pipe, about 100 tons of fittings and 265 valves. Pipe prices are reported firm at $55.10 a ton, delivered common Boston freight rate points, on 6-in. pipe and larger, and at $60.10 on 4-in., with the usual $5 differential on Class A and gas pipe. Probably these prices might be shaded, however, on large tonnages.

Shapes and Plates.—The plate market is more active than it has been in some time. Current buying, on a basis of 2.065c. per lb., delivered, or 1.70c. on cars Pittsburgh, is in anticipation of higher prices and not because of any noticeable increase in consumption. Shapes also are in somewhat heavier demand at 2.265c. per lb., delivered, or 1.90c. on cars Pittsburgh, but the market is not active. Fabricators report more sounding out of the market by contractors, especially on jobs requiring 500 tons of steel or less.

Coke.—Specifications against first half contracts for New England by-product foundry coke were smaller the first 15 days of March than those for the corresponding periods in January and February. The falling off in specifications is attributed to the working down of foundry storage piles, a reduction in the aggregate New England iron melt and expectations by consumers that prices will be lower. The New England Coal & Coke Co. and the Providence Gas Co., however, are holding at $13 a ton, delivered within a $3.10 freight rate zone. Connellsville foundry coke is still considerably cheaper, good grades being obtainable at $10.55 a ton, delivered, but comparatively little is coming into New England. Contrary to earlier predictions by the trade, coke importations continue. Two sizable cargoes from the British Isles have been landed here so far this month, one of 3000 tons and the other 4000 tons.

Old Material.—Sentiment in old material circles is mixed, but generally bearish. Some business in heavy melting steel for Pittsburgh district delivery was closed the past week at $11 to $11.50, on cars shipping point. On the other hand, the best dealers can do in some instances for eastern Pennsylvania delivery is $10.60, but they admit their inability to secure material on that basis. Pipe has been purchased at $10.10, on cars, while the bulk of current business is at $11 to $11.50. Less than $9, on cars, has been paid for bundled skeleton, but the bottom of the market today seems to be $9. Old material quotations in general are practically unchanged from a week ago, while business is less active. Numerous rejections by mills are reported, and dealers are having difficulty in securing reshipping instructions.

The following prices are for gross-ton lots delivered consuming points:

Textile cast	$19.00 to $19.50
No. 1 machinery cast	18.50 to 19.00
No. 2 machinery cast	14.00 to 15.00
Stove plate	14.00 to 14.50
Railroad malleable	19.00 to 19.50

The following prices are offered per gross-ton lots, f.o.b. Boston rate shipping points:

No. 1 heavy melting steel	$11.00 to $11.50
No. 1 railroad wrought	13.00 to 13.50
No. 1 yard wrought	12.00 to 12.50
Wrought pipe (1 in. in diameter, over 2 ft. long)	11.00 to 11.25
Machine shop turnings	8.50 to 9.00
Cast iron borings, chemical	11.00 to 11.50
Cast iron borings, rolling mill	8.50 to 9.00
Blast furnace borings and turnings	8.00 to 8.50
Forged scrap	9.00 to 9.50
Bundled skeleton, long	9.00 to 9.50
Forged flashings	9.00 to 9.50
Bundled cotton ties, long	8.50 to 9.00
Bundled cotton ties, short	9.50 to 10.00
Shafting	17.00 to 17.25
Street car axles	17.00 to 17.25
Rails for rerolling	12.50 to 13.00
Scrap rails	11.00 to 11.50

Old Material at Detroit Unchanged in Absence of Purchasing

DETROIT, March 16.—With mills and furnaces still holding up purchasing for future requirements of waste material, the scrap market in this district is very quiet and the prices remain unchanged.

The following prices are quoted on a gross ton basis f.o.b. producers' yards, excepting stove plate, No. 1 machinery cast and automobile cast, which are quoted on a net ton basis:

Heavy melting and shoveling steel	$13.50 to $14.00
Borings and short turnings	10.00 to 10.50
Long turnings	9.00 to 9.50
No. 1 machinery cast	17.00 to 18.00
Automobile cast	23.00 to 24.00
Hydraulic compressed	11.75 to 12.25
Stove plate	13.50 to 14.50
No. 1 busheling	11.75 to 12.25
Sheet clippings	7.00 to 7.50
Flashings	10.50 to 11.00

Cincinnati

Pig Iron Buyers Wait—Steel Specifications Light

CINCINNATI, March 16.—The proximity of the second quarter has failed to bring out a marked increase in the volume of business, and most consumers are satisfied to purchase only enough tonnage to cover their present needs. Many buyers have been postponing action in the expectation that the pressure for business would become so severe that furnaces would make concessions from present quotations. Producers in the Ironton district are booking small lots of foundry iron at $21, base Ironton. It is believed that this price would be shaded to secure a sizable tonnage, although furnaces have given no intimation to that effect. Tennessee iron is steady at $21.50, base Birmingham. Sales of Alabama iron at $22, base Birmingham, have been limited to single carloads. Jackson County silvery furnaces are holding consistently to their price schedule, but are booking little new business. That malleable iron is weak was shown in the sale of 3000 tons to the Muncie Malleable Iron Co., Muncie, Ind., by a Cleveland producer at less than $20, furnace. The absence of important inquiries is noted in the local market. The Andrews Steel Co., Newport, Ky., is expected to buy 100 tons of ferromanganese.

Based on freight rates of $3.69 from Birmingham and $1.89 from Ironton, we quote f.o.b. Cincinnati:

Alabama fdy., sil. 1.75 to 2.25 (base)	$25.69
Alabama fdy., sil. 2.25 to 2.75	26.19
Tennessee fdy., sil. 1.75 to 2.25	25.19
Southern Ohio silvery, 8 per cent	32.39
So. Ohio fdy., sil. 1.75 to 2.25	22.89
So. Ohio malleable (nominal)	$22.39 to 22.89

Finished Material.—Consumers have been slow in specifying their requirements, partly because the inclement weather has retarded their operations and partly because they are not interested in forward buying. They have little stock on hand, but prefer to rely upon mills for prompt deliveries rather than to contract for sizable tonnages. Little change in the present unsatisfactory condition is anticipated by sellers in the immediate future. The bar market is sluggish, although mills are having no difficulty in obtaining 2c., base Pittsburgh. Structural shapes are quiet. Efforts to establish 2c. base Pittsburgh, for second quarter have proved unsuccessful and the price is likely to remain at 1.90c. The large producers are unwilling to book second quarter plate business under 1.90c., base Pittsburgh, but reports are current that a small mill has quoted 1.85c. per lb. on lots as small as 100 tons. Most of the orders for sheets are being taken at 3.35c., base Pittsburgh, for black, 4.60c. for galvanized, and 2.50c. for blue annealed. However, a large buyer claims that he secured a substantial tonnage during the past week at $2 less than those prices. The release of a considerable volume of sheets held up by automobile makers has aided producers in this vicinity in maintaining fairly good operating schedules. One mill's output averaged 70 per cent of capacity in the past week, while another company ran at 80 per cent. Producers have been unable to build up any backlog and are almost wholly dependent upon current business in arranging rolling schedules. There is a moderate demand for wire and nails, and prices are stronger. Common wire nails remain at $2.65 a keg, Pittsburgh or Ironton, and plain wire at $2.50 per 100 lb., Pittsburgh or Ironton. Cold weather and snow have interfered with activity in fencing.

The Louisville & Nashville is in the market for 750 tons of plates.

Reinforcing Bars.—With awards confined to lots ranging from 25 to 50 tons, and with no important inquiries before the trade, the market is quiet. New billet bars are quoted at 2c., Cleveland, and rail steel bars at 1.90c., mill, but there has been no opportunity to test these prices.

Warehouse Business.—A slight improvement in business is reported by leading jobbers, but it is still below normal. Sales in the first half of March equaled those in the same period last month. An increased demand for plates is noted, but bars and structural shapes are

moving slowly. Floor plates have been reduced from 5.65c. to 5.25c. per lb., local warehouse. Otherwise quotations are unchanged.

Cincinnati jobbers quote: Iron and steel bars, 3.30c. per lb.; reinforcing bars, 3.30c.; hoops, 4c. to 4.25c.; bands, 3.95c.; shapes, 3.40c.; plates, 3.40c.; cold-rolled rounds and hexagons, 3.85c.; squares, 4.35c.; open-hearth spring steel, 4.75c. to 5.75c.; No. 10 blue annealed sheets, 3.60c.; No. 28 black sheets, 4.10c. to 4.30c.; No. 28 galvanized sheets, 5.25c. to 5.40c.; No. 9 annealed wire, $3 per 100 lb.; common wire nails, $2.95 per keg base; cement coated nails, $2.25 per keg; chain, $7.55 per 100 lb. base; large round head rivets, $3.75 base; small rivets, 65 per cent off list. Boiler tubes, prices net per 100 ft., lap-welded steel tubes, 2-in., $18; 4-in., $38; seamless, 2-in., $19; 4-in., $39.

Coke.—There has been a slight decrease in the demand for by-product foundry coke, although specifications for the month will probably exceed those in February. Activity in by-product domestic grades has tapered off, and indications point to a drop of $1.50 to $2 a ton on April 1. A prominent Wise County producer has announced a reduction of 50c. a ton on both foundry and furnace coke, and foundry grades from that district are now selling at $4.75 to $5, ovens. The movement of New River foundry is fair in volume but consists mostly of lots ranging from 30 to 100 tons. A few sales of Connellsville furnace coke has been made locally at $3.25, ovens.

Based on freight rates of $2.14 from Ashland, Ky., $3.53 from Connellsville, and $2.59 from Wise County ovens and New River ovens, we quote f.o.b. Cincinnati: Connellsville foundry, $8.03 to $9.03; Wise County foundry, $7.34 to $7.59; New River foundry, $9.59 to $10.09; by-product foundry, $10.64.

Old Material.—Although no increase in sales is reported, there is a better tone to the market. The Ashland, Ky., works of the American Rolling Mill Co. continue to hold up shipments, and other mills in this territory are accepting only moderate amounts of scrap. In the face of a dragging market, quotations are firm and heavy melting steel is bringing $13. Railroad lists offered in the past week brought out good prices.

We quote dealers' buying prices, f.o.b. cars, Cincinnati:

Per Gross Ton	
Heavy melting steel	$13.00
Scrap rails for melting	$13.00 to 13.50
Short rails	18.00 to 18.50
Relaying rails	27.00 to 27.50
Rails for rolling	14.00 to 14.50
Old car wheels	12.50 to 13.00
No. 1 locomotive tires	16.50 to 17.00
Railroad malleable	15.50 to 16.00
Agricultural malleable	14.50 to 15.00
Loose sheet clippings	8.00 to 9.00
Champion bundled sheets	10.00 to 10.50
Per Net Ton	
Cast iron borings	8.00 to 8.50
Machine shop turnings	7.00 to 7.50
No. 1 machinery cast	19.00 to 19.50
No. 1 railroad cast	14.50 to 15.00
Iron axles	22.00 to 22.50
No. 1 railroad wrought	10.00 to 10.50
Pipes and flues	8.50 to 9.00
No. 1 busheling	9.50 to 10.00
Mixed busheling	8.00 to 8.50
Burnt cast	8.50 to 9.00
Stove plate	9.50 to 10.00
Brake shoes	10.00 to 10.50

Buffalo

Pig Iron Buyers Wait for Break Despite Firm Prices—Mills at 80 Per Cent

BUFFALO, March 16.—Certain buyers of sizable tonnages in this territory will have to place their requirements in a short time, makers believe, but are withholding actual purchasing, hoping for a break in prices. Two 2000-ton inquiries now before the market have been out for two weeks without placement. These buyers believe they can break $21, Buffalo, on No. 2 plain foundry and malleable. Other inquiries are light, with probably not more than 5000 tons of new business up for quotations.

We quote prices per gross ton, f.o.b. Buffalo, as follows:

No. 2 plain fdry., sil. 1.75 to 2.25	$21.00
No. 2X foundry, sil. 2.25 to 2.75	21.50
No. 1X foundry, sil. 2.75 to 3.25	22.50
Malleable, sil. up to 2.25	21.00
Basic	$20.50 to 21.00
Lake Superior charcoal	29.28

Finished Iron and Steel.—Buffalo mills continue to operate around 80 per cent of capacity, with 31 out of 38 open-hearth furnaces going. New business is coming in at about the same rate as for the past two weeks. Prices are no weaker and no stronger, though some interests report firmer sheet prices. Local wire makers say business is good, with a noticeable pickup during the past two weeks. Inquiries run from a carload up to four or five carloads. Reinforcing bar business is good, with about 2000 tons at the point of being booked. A school at Wellsville, N. Y., 250 tons, has been placed. Prices on reinforcing bars are 2.265c., Buffalo, from mill; 2.75c. from stock, and 2.85c. from stock delivered by truck.

Warehouse prices are being quoted as follows: Steel bars, 3.30c. per lb.; steel shapes, 3.40c.; steel plates, 3.40c.; No. 10 blue annealed sheets, 3.90c.; No. 28 black sheets, 4.60c.; No. 28 galvanized, 5.75c.; cold-rolled shapes, 4.45c.; cold-rolled rounds, 3.95c.; wire nails, 3.90c.; black wire, 3.90c.

Old Material.—The market remains weak, with no buying of consequence. Prices are stationary. The fact that scrap production will be heavier in a short time accentuates the weakness of the situation. Heavy melting steel ranges from $15 to $15.50. It is reported that one large consuming mill here might be induced to pay $15.50 for a round tonnage. There is still some demand for stove plate at $15.25. This commodity is rather scarce and is about the firmest grade in the scrap list. A letup in the severe weather is giving the yards an opportunity to operate. There has been some very light buying of cast iron borings and mixed borings and turnings at a figure said to have been $12.50. The last purchases made by a Tonawanda, N. Y., consumer are reported to have been made at close to $14.

We quote prices per gross ton, f.o.b. Buffalo, as follows:

Heavy melting steel	$15.00 to $15.50
Low phosphorus	18.50 to 19.00
No. 1 railroad wrought	14.00 to 14.50
Car wheels	17.00 to 17.50
Machine shop turnings	11.00 to 11.50
Mixed borings and turnings	12.00 to 12.50
Cast iron borings	12.00 to 12.50
No. 1 busheling	14.00 to 14.50
Stove plate	15.00 to 15.25
Grate bars	13.00 to 13.50
Hand-bundled sheets	11.00 to 11.50
Hydraulic compressed	14.00 to 14.50
No. 1 machinery cast	15.50 to 16.00
Railroad malleable	18.50 to 19.00
No. 1 cast scrap	17.00 to 17.50
Iron axles	24.00 to 25.00
Steel axles	16.00 to 16.50

Cleveland

Pig Iron Declines Again—Automobiles Being Stocked—Sheet Prices Irregular

CLEVELAND, March 16.—The demand for finished steel in small lots is holding up well, and some of the mills report a gain in specifications in the first half of the month over the corresponding periods of January and February. Consumers are showing a little more interest in second quarter contracts, but not much business has been booked for that delivery. With mills able to make quick shipments, consumers are not ordering material except for early requirements. Weakness has developed in pig iron with a decline of 50c. on foundry iron in the Cleveland and Valley districts. The McKinney Steel Co. has blown in an additional furnace in Cleveland, now operating three out of four stacks.

Steel specifications from the automotive industry have fallen off somewhat since the first of the month, and reports from Detroit indicate that some of the car builders have made a slight decrease in their production schedules. Weather conditions evidently have retarded the spring automobile sales, and some of the motor car manufacturers are putting cars in stock.

There is little change in the price situation the past week. The plate market is firmer than for some time. Mills generally quote plates at 1.90c., Pittsburgh, and if that price could be shaded it would be only on an attractive tonnage. Plates for 22 Southern railway locomotives have been placed with a Cleveland mill.

Efforts to get above 2c. for steel bars, except for the small lots that usually command that price, have not met with much success. Structural material is quoted at 1.90c. to 2c., the higher price applying only to small lots. Hot-rolled strip steel is firm at regular quotations, but some shading is reported on cold-rolled strips. A lull has developed in building activity in this territory.

Pig Iron.—The market is weak, with prices not fully tested in Cleveland and the Valley districts. Last week we reported sales of foundry iron at $20 in the Valley district, a decline of 50c. a ton. This price has now become quite common, and it seems probable that it would be shaded about 50c. for round-lot orders. In Cleveland there has been a further reduction of 50c. a ton to $21, at furnace, for local delivery. Consequently Valley producers will have to go to $19.75, furnace, to meet local competition in Cleveland. Lake iron prices in Michigan, western Ohio and Indiana are unchanged at $22, furnace. While basic iron is still normally quoted at $20, this price has been shaded about $1 a ton on a purchase of 2000 tons of resale spot shipment iron by a northern Ohio consumer. This iron will be shipped from Valley furnaces. More inquiry is coming out, but sales the past week were not quite so large as during the previous week. Two local interests sold 10,000 tons. The Muncie Malleable Iron Co., Muncie, Ind., has purchased 3000 tons of malleable iron, and a Columbus foundry is reported to have bought 500 tons of malleable iron. The Westinghouse Electric & Mfg. Co. is inquiring for 2600 tons of iron for its Cleveland plant, 2000 tons in 2.75 to 3.25 per cent silicon iron and the remainder lower in silicon. Lower prices are looked for on Southern foundry iron. Silvery iron is unchanged, but consumers are buying from hand to mouth with the expectation of lower prices.

Quotations below, except on basic and low phosphorus iron, are delivered Cleveland, and for local iron include a 50c. switching charge. Ohio silvery and Southern iron prices are based on a $3.02 freight rate from Jackson and $6.01 from Birmingham:

Basic, Valley furnace	$20.00
N'th'n No. 2 fdy., sil. 1.75 to 2.25	21.50
Southern fdy., sil. 1.75 to 2.25	28.01
Malleable	21.50
Ohio silvery, 8 per cent	33.52
Standard low phos., Valley furnace	27.50 to 28.00

Iron Ore.—Prices for the season have not yet been named, but it is expected that they will be established by the first of April. While there is still talk of a 25c. advance, the trend of the pig iron market is not favorable to higher ore prices.

Semi-Finished Steel.—Consumers are showing little interest in second quarter contracts for sheet bars and slabs. However, a few sales have been made for April shipment. Neither makers nor consumers look for any change from present prices for the second quarter.

Sheets.—New demand for sheets is moderate, and few buyers are placing second quarter contracts. Some consumers still have considerable tonnage due on first quarter contracts, part of which will probably be carried over. Price irregularity is still very much in evidence in black sheets, on which 3.25c., base Pittsburgh, is being quoted by some producers. Even that price is being shaded, although several mills are holding to 3.35c. Concessions are also being made on galvanized sheets, but blue annealed sheets are quite firm at 2.50c.

Reinforcing Bars.—Demand continues rather light, although three new inquiries aggregating 800 tons have come out. While new billet steel bars are quoted at 2c., Pittsburgh, the market is not firm at the price. Rail steel bars are unchanged at 1.80c., mill.

Warehouse Business.—Orders are heavy and show a gain over last month. The market on steel bars, plates and structural material is firm at the new prices. Hoops and bands, which have been irregular, are now well established at a lower basis.

Jobbers quote steel bars, 3c. per lb.; plates and structural shapes, 3c.; No. 28 black sheets, 4.10c.; No. 28 galvanized sheets, 5.25c.; No. 10 blue annealed sheets, 3.25c.; cold-rolled rounds and hexagons, 3.90c.; flats and squares, 4.40c.; hoops and bands, 3.65c.; No. 9 annealed wire, $3 per 100 lb.; No. 9 galvanized wire, $3.45 per 100 lb.; common wire nails, $3 base per keg.

Coke.—Very few consumers have covered for coke for the second quarter, and their present disposition is to buy from hand to mouth. Connellsville foundry coke prices are unchanged at $5 to $6, ovens, for better grades. By-product furnace coke for domestic use has declined 50c. further, now being quoted at $6, ovens, for both egg and nut sizes. Ohio by-product foundry coke is unchanged at $8.50, ovens.

Bolts, Nuts and Rivets.—Leading bolt and nut makers have opened books for second quarter contracts at present discounts. The present regular price of $2.60 will probably be named on large rivets for the second quarter. On current orders large rivets are still shaded to $2.50, but that price is not being met by the leading local maker. The volume of bolt and nut business continues good.

Ferromanganese.—Another $5 a ton reduction was made Saturday on domestic ferromanganese, making the price $95, furnace.

Old Material.—Borings and turnings continue to show a downward price tendency. They are now being produced here in excess of the local demand, and local prices are too low to allow Detroit scrap to come to this city. Sales were made during the week for delivery to a Cleveland consumer at $11.50 to $11.65. Busheling has declined with borings and turnings. Outside of the grades mentioned and a slight decline on machine shop turnings, there were no price changes during the week, but the tone of the market is weak. Some heavy melting steel was bought by dealers at $16.75 for delivery to a Valley mill.

We quote dealers' prices f.o.b. Cleveland per gross ton:

Heavy melting steel	$14.25 to $14.50
Rails for rolling	16.75 to 17.00
Rails under 3 ft.	18.50 to 19.00
Low phosphorus melting	17.75 to 18.25
Cast iron borings	11.00 to 11.25
Machine shop turnings	10.75 to 11.00
Mixed borings and short turnings	11.00 to 11.25
Compressed sheet steel	13.25 to 13.50
Railroad wrought	13.75 to 14.25
Railroad malleable	20.00 to 20.50
Light bundled sheet stampings	11.75 to 12.00
Steel axle turnings	14.00 to 14.50
No. 1 cast	17.50 to 18.00
No. 1 busheling	11.00 to 11.25
Drop forge flashings	13.25 to 13.50
Railroad grate bars	13.25 to 13.50
Stove plate	13.25 to 13.50
Pipes and flues	11.50 to 12.00

New York

Little Second Quarter Steel Buying—Domestic Stacks Get More Business

NEW YORK, March 16.—Foreign pig iron is still being pressed for sale at prices ranging from $20.50 to $22, duty paid port of entry, but nevertheless prices on domestic iron are holding. In fact, the larger part of 6000 tons sold in this district during the past week was domestic metal. Nothing resembling a buying movement has developed, but more interest is being shown in the market. The Gilbert & Barker Mfg. Co., Springfield, Mass., has closed for 2000 tons of No. 2 X foundry for March and April shipment. Of the total at least 1000 tons and was bought from American producers. The Richardson & Boynton Co. has closed for 800 tons of No. 2X foundry, of which 500 tons was placed with a Buffalo furnace and the remainder with an eastern Pennsylvania stack. The Draper Corporation, Hopedale, Mass., has bought 3000 tons. Brown & Sharpe Mfg. Co., Providence, R. I., which recently placed 250 tons, has closed for an additional 125 tons. A number of melters are sounding out the market. The National Radiator Co. is expected to issue inquiries shortly for 10,000 tons for its Johnstown, Pa., and Trenton, N. J. plants. The Crane Co., Bridgeport, Conn., is in the market for 1200 tons of foundry iron, ranging in silicon content from 3.25 to 4.25 per cent for early shipment. Approximately 500 tons of Virginia iron was sold in this district last week at $24, base furnace. The new Troy, N. Y., furnace expects

to go in March 25, and is selling iron on the basis of $21, Buffalo.

We quote per gross ton delivered in the New York district as follows, having added to furnace prices $2.52 freight from eastern Pennsylvania, $4.91 from Buffalo and $5.54 from Virginia:

East. Pa. No. 2 fdy., sil. 1.75 to 2.25	$24.52
East. Pa. No. 2X fdy., sil. 2.25 to 2.75	25.02
East. Pa. No. 1X fdy., sil. 2.75 to 3.25	25.52
Buffalo fdy., sil. 1.75 to 2.25	25.91
No. 2 Virginia fdy., sil. 1.75 to 2.25	29.54

Ferroalloys.—The ferromanganese "price war" continues. The two most active domestic producers have reduced prices from $100 to $95, seaboard basis, and importers of the electric product have met this quotation. The British producers have not changed their quotation which is $110, seaboard, with one still at $115. Fair sales are reported at $95, but it is believed that the total is small under the circumstances. In spiegeleisen sales and inquiries are confined to carload and small lots, the total volume being small. Prices are unchanged but specifications on contract are heavy. An interesting prediction is that the price reductions may go still further, especially as it is not at all unlikely that manganese ore prices will recede. It is stated that the British price for ferromanganese on the European continent is equivalent to $97.50 here.

Finished Steel.—Efforts of some of the steel companies to advance prices for second quarter on certain products over those prevailing in this quarter have not met with any important measure of success. Such contracts as have been entered into for the next quarter, and these are few in number, have been at first quarter prices, and to these prices buyers have taken no exception. The strongest effort to raise prices is being made by Eastern plate mills, at least two of which have announced an advance of $2 a ton to 1.90c., Pittsburgh, for second quarter delivery, while one of these companies is now naming 1.90c. for any delivery. An effort is being made also to increase the price of shapes to 2c., Pittsburgh, but so far as is known no contracts have been written at that figure. Steel bar contracts at 2c. have been made by several of the mills, though small buyers are being asked to pay 2.10c. Those sheet mills which adhere rigidly to the full prices are not meeting with much success in closing contracts, as the concessions of $1 and $2 a ton offered by a few of the smaller mills have somewhat upset buyers' confidence in price stability. The opinion of many in the steel trade who have approached their customers regarding forward requirements is that most of the contracting will be done at first quarter prices. Buying in the past week has shown a slight gain in some lines, while in other lines orders are at about the rate of recent weeks. Structural steel is a little more active. Three important projects are an office building to be erected on Forty-second Street, New York, which will take 12,000 tons; an office building in Japan, requiring 8000 tons, and a highway bridge over the Kennebec River in Maine, 7500 tons.

We quote for mill shipments, New York delivery, as follows: Soft steel bars, 2.34c. to 2.44c. per lb.; plates, 2.14c. to 2.24c.; structural shapes, 2.24c. to 2.34c.; bar iron, 2.24c.

Coke.—Foundry coke continues fairly firm at $4.75 to $5.50 per ton with a moderate demand from consumers. Medium sulphur and distress tonnages of domestic coke range in price down to as low as $2.25 per ton. By-product is unchanged at $11.52 per ton, delivered Newark or Jersey City, N. J.

Cast Iron Pipe.—Municipal buying of bell and spigot water pipe continues the feature of the market with the competition from the imported product. At Saugerties, N. Y., where bids were opened on about 3000 tons, an informal bid by the United States Cast Iron Pipe & Foundry Co. on centrifugal pipe is understood to have been lowest but was rejected. Morristown, N. J., has awarded about 800 tons of water pipe to the Pont-a-Mousson works. Schenectady, N. Y., has rejected all bids and is calling for new prices. The 5000 tons of water pipe for Barranquilla, Colombia, on which American foundries were recently quoting through exporters, is understood to have been awarded to the Pont-a-Mousson works in France.

We quote pressure pipe per net ton, f.o.b. New York in carload lots, as follows: 6-in. and larger, $50.60 to $52.60; 4-in. and 5-in., $55.60 to $57.60; 3-in., $65.60 to $67.60; with $5 additional for Class A and gas pipe.

Warehouse Business.—While there has been a gradual improvement in demand for material out of stock since the first of the month, orders are for small lots and the total tonnage is consequently small. The increased volume of business, however, has apparently had a steadying effect on the market and jobbers report less tendency toward concessions. Black and galvanized sheets are unchanged in price but firmer than for some time. Slight concessions are still being made on tonnages of structural material, but warehouses show less inclination to lower prices. On the whole business is improved but not of the volume usual at this season. Of the non-ferrous metals, lead is the weak spot and antimony has registered a slight downward movement. Prices on page 830. We quote boiler tubes per 100 ft. as follows:

Lap welded steel tubes, 2-in., $17.33; seamless steel, 2-in., $20.24; charcoal iron, 2-in., $25; 4-in., $67.

Old Material.—Most grades are unchanged and the market is still quiet. The downward movement of prices, however, has ceased at least temporarily and there is a better undertone to the entire market. While there is still no contracting by consumers for large tonnages, consumers' stocks are reported low and some mills are beginning to take deliveries of small lots. No. 1 heavy melting steel is unchanged at $15.50 per ton up to $16 in some cases. Iron and steel pipe shows a range of $1 per ton on current buying prices, $15.50 per ton being paid delivered to a Columbia consumer and $16.50 per ton delivered to a Lebanon plant. Heavy breakable cast ranges from $16 to $16.25 paid on deliveries to a Harrisburg user to $17.50 per ton paid on deliveries to a consumer in Florence, N. J.

Buying prices per gross ton, New York, follow:

Heavy melting steel (yard)	$10.50 to $11.00
Heavy melting steel (railroad or equivalent)	12.00 to 12.75
Rails for rolling	12.75 to 13.00
Relaying rails, nominal	23.00 to 24.00
Steel car axles	19.50 to 20.00
Iron car axles	23.50 to 24.00
No. 1 railroad wrought	14.00 to 14.50
Forge fire	10.00 to 10.50
No. 1 yard wrought, long	13.00 to 13.50
Cast borings (steel mill)	9.75 to 10.25
Cast borings (chemical)	13.00 to 14.00
Machine shop turnings	9.75 to 10.25
Mixed borings and turnings	10.00 to 10.25
Iron and steel pipe (1 in., diam., not under 2 ft. long)	11.75 to 12.75
Stove plate (steel mill)	9.75 to 10.25
Stove plate (foundry)	11.25 to 11.75
Locomotive grate bars	11.25 to 11.75
Malleable cast (railroad)	16.00 to 16.50
Cast iron car wheels	13.50 to 14.00
No. 1 heavy breakable cast	12.50 to 14.50

Prices which dealers in New York and Brooklyn are quoting to local foundries per gross ton follow:

No. 1 machinery cast	$17.00 to $17.50
No. 1 heavy cast (column, building material, etc.), cupola size	15.50 to 16.00
No. 2 cast (radiators, cast boilers, etc.)	14.50 to 15.00

Will Install Wilputte By-Product Coke Ovens at Everett, Mass.

The New England Fuel & Transportation Co. has contracted with the Wilputte Coke Oven Corporation, New York, for the building of an additional battery of 55 by-product ovens at Everett, Mass. The company now has 400 United-Otto ovens. The new ovens are being provided partly for the purpose of supplying coke to the Mystic blast furnace, which is being built for the New England Fuel & Transportation Co., whose coke-selling subsidiary is the New England Coal & Coke Co.

Production of steel cloth has been resumed by the Norton Iron Works, Ashland, Ky., after suspension of operations during the past two years.

Philadelphia

Basic Pig Iron Sale of 10,000 Tons—Steel Sales in Moderate Volume

PHILADELPHIA, March 16.—Although second quarter buying of pig iron has not opened up in any appreciable volume, there has been a purchase of 10,000 tons of basic by a steel maker in this district, and another is expected to close for its requirements, probably 30,000 tons, within the next two weeks. Foundry iron buyers seemingly are in no hurry to cover, many of them being protected through April by hangover tonnage on furnace books.

The volume and character of steel buying shows no change. There is a fairly good amount of miscellaneous business, but very little forward buying or tonnages of large size. Talk of higher prices on some products for second quarter has apparently had little effect on the attitude of buyers, most of whom are satisfied that mill conditions will continue to favor fairly prompt shipments at prices no higher than those prevailing during first quarter. A possible exception is the price of plates from Eastern mills. All of the mills of this district now name 1.90c., Pittsburgh, a $2 advance, to be effective April 1, and one mill has made this price effective at once. The mills justify their claim to the advance on the need for profits rather than on business prospects.

A purchase of several thousand tons of heavy melting steel scrap at $16.50, delivered, has revived hopes for a better market for scrap, which has been notably weak.

Ferromanganese.—Makers of ferromanganese on Monday announced a further reduction of $5 a ton, making the present selling price $95, furnace. Sellers of British ferromanganese are still out of the running, as they have not been authorized to quote below $110, seaboard.

Billets.—With demand very light, the prices on billets remain unchanged at $35, Pittsburgh, for rerolling quality, and $40, Pittsburgh, for forging quality.

Pig Iron.—A steel company in this district has bought about 10,000 tons of basic pig iron for second quarter delivery at $22.25, delivered, the business being divided between two furnaces. Another steel company, whose second quarter requirements will probably be 30,000 tons or more, is expected to come into the market within the next two weeks. These are the first signs of any important buying for the next quarter. Foundry iron users in this district are almost mute as to their second quarter needs, but there has been a fairly good inquiry from the New England and New York districts, much of which has not been closed. Foundry iron prices are holding at $22, furnace, for No. 2 plain, and at $22.50 for No. 2X, and conditions seem to favor a fairly stable market at around these figures. Foreign iron will probably become a less serious factor because higher prices in Europe will make it impossible to replace iron which has recently been sold here at low prices, such iron having been bought before the advance abroad. Much of the Indian iron which has been coming to the Atlantic seaboard will now be shipped to Japan. During the heavy buying movement in the latter part of 1925 most of the domestic furnaces booked more iron than can be shipped by April 1 and there are orders on furnace books sufficient in nearly all cases to run well through April and even into May. Therefore the furnaces are not unduly anxious to sell at any further concessions, prices having dropped $1 a ton from the peak of the recent upward movement. Although only one Virginia furnace is operating, that of the Pulaski Iron Co., the situation in that district is healthier than it has been in some time. The Pulaski furnace has a good order book. A recent sale of 10,000 tons of iron to a Virginia cast iron pipe company and miscellaneous sales to foundries have provided an outlet for about two months' production. Output in the eastern Pennsylvania district will be swelled by the blowing in this week of a Bethlehem furnace at Coatesville, and some of this iron may find its way into the merchant market. Bethlehem has also put in blast a furnace at Bethlehem and one at Johnstown.

The following quotations are, with the exception of those on low phosphorus iron, for delivery at Philadelphia and include freight rates varying from 76c. to $1.63 per gross ton:

East. Pa. No. 2 plain, 1.75 to 2.25 sil.	$22.76 to $23.63
East. Pa. No. 2X, 2.25 to 2.75 sil.	23.26 to 24.13
East. Pa. No. 1X	23.76 to 24.63
Virginia No. 2 plain, 1.75 to 2.25 sil.	27.67 to 28.67
Virginia No. 2X, 2.25 to 2.75 sil.	28.17 to 29.17
Basic, delivered eastern Pa.	22.25 to 22.50
Gray forge	22.50 to 23.00
Malleable	23.00 to 23.50
Standard low phos. (f.o.b. furnace)	22.50 to 23.50
Copper bearing low phos. (f.o.b. furnace)	23.50 to 24.00

Plates.—Eastern plate mills are trying an interesting experiment in raising their prices $2 a ton for second quarter, admitting that the advance is called for by costs and the need for profits rather than by business prospects. One mill has named 1.90c., Pittsburgh, effective at once, while the others are quoting this price to take effect April 1. The effort of some of the mills is now centered on getting a substantial volume of orders at 1.80c., and a good deal of such tonnage will run over into April. The second quarter price has been announced too recently to afford any indication of the attitude of buyers. No second quarter contracts at 1.90c. have been entered, and the probability is that some consumers will anticipate their requirements before the advance becomes effective, as they did for first quarter.

Structural Material.—The present price situation in this district does not hold out much hope for the mills as to higher prices for second quarter. For Philadelphia and nearby delivery, current quotations figure back to 1.80c., Pittsburgh, on the larger lots, with 1.85c. and 1.90c. on small lots. There is a fairly good number of small orders from fabricators and jobbers, but new projects involving large tonnages are few.

Bars.—Some steel bar contracts for second quarter have been taken by the mills at 2c., Pittsburgh. Smaller buyers, who have been asked to pay 2.10c., have objected, but apparently there is no exception taken to a continuance of the first quarter price. Bar iron demand is only fair, the price remaining at 2.22c., Philadelphia.

Sheets.—Most of the mills are holding firmly to the full prices, which are 2.50c. for blue annealed, 3.35c. for black and 4.60c., Pittsburgh, for galvanized sheets, but consumers and jobbers are showing little interest in second quarter contracts. A few mills offer concessions of $1 and $2 a ton for prompt specifications.

Imports.—Pig iron imports in the week ended Saturday totaled 8147 tons, of which 4900 tons came from England, 2200 from Germany, 225 from India, 100 from France, 500 from Belgium and 62 from the Netherlands. Other imports were as follows: Structural steel from Belgium, 160 tons; steel bars from Belgium, 119 tons; hoops from Belgium, 18 tons; charcoal iron bars from Sweden, 29 tons; steel billets from Sweden, 162 tons; ferromanganese from England, 100 tons; iron ore from Germany, 1091 tons; manganese ore from England, 48 tons; chrome ore from Portuguese Africa, 4500 tons.

Old Material.—After weeks of inactivity and weak prices, the scrap market took a slight turn for the better as the result of a purchase of about 6000 tons of heavy melting steel by a nearby plate mill. The price paid was $16.50, delivered, which was $1 above the minimum quotation of the last few weeks. Another steel company is freely offering $16, but is picking up only single carloads at this price. A third steel company is expected to come into the market next week, and the price it will pay will probably be not less than $16.50. A locomotive company bought a fairly large tonnage of No. 1 cast scrap at $18.50, but in this case a premium was exacted by sellers for the quick delivery required. Other grades have not changed either in respect to demand or price, but the tone of the market is somewhat better. Brokers are not hopeful of any

marked advance, but believe that prices will range at least 50c. a ton higher over the next month or so.

We quote for delivery, consuming points in this district, as follows:

No. 1 heavy melting steel	$16.00 to $16.50
Scrap rails	16.00 to 16.50
Steel rails for rolling	17.00 to 17.50
No. 1 low phos., heavy, 0.04 per cent and under	20.00 to 20.50
Couplers and knuckles	19.00 to 19.50
Rolled steel wheels	19.00 to 19.50
Cast iron car wheels	17.50 to 18.00
No. 1 railroad wrought	17.00 to 17.50
No. 1 yard wrought	16.50 to 17.00
No. 1 forge fire	14.50 to 15.00
Bundled sheets (for steel works)	14.00
Mixed borings and turnings (for blast furnace)	13.00 to 13.50
Machine shop turnings (for steel works)	14.00
Machine shop turnings (for rolling mill)	14.00 to 14.50
Heavy axle turnings (or equivalent)	15.00
Cast borings (for steel works and rolling mill)	14.00
Cast borings (for chemical plant)	15.50 to 16.00
No. 1 cast	17.50 to 18.50
Heavy breakable cast (for steel works)	16.00 to 16.50
Railroad grate bars	14.50
Stove plate (for steel works)	14.50
Wrought iron and soft steel pipes and tubes (new specifications)	15.50 to 16.00
Shafting	21.00 to 22.00
Steel axles	22.00 to 23.00

FABRICATED STEEL

Office Building in New York Requiring 12,000 Tons Largest Project of Week

Structural steel awards, as reported to THE IRON AGE, totaled slightly less than 20,000 tons for the week ended Tuesday. New projects up for bids total more than 33,000 tons, of which 12,000 tons is for the Salmon Building, to be erected on Forty-second Street, New York. Awards follow:

NEW YORK, 200 tons, in the following awards reported by the Structural Steel Board of Trade: Repairs on Hell Gate power plant of the United Electric Light & Power Co. to Post & McCord; telephone building in Nyack, N.Y., for the New York Telephone Co. to Eidletz & Ross.

NEW YORK, 800 tons, loft building on West Thirty-fifth Street, to Post & McCord.

NEW YORK, 450 tons, apartment hotel at 28-32 East Sixty-third Street, to Bethlehem Fabricators, Inc.

NEW YORK, 140 tons, East River Savings Bank, 743 Amsterdam Avenue, to Bethlehem Fabricators, Inc.

NEW YORK, 800 tons, loft building on East Fifty-seventh Street, to Harris Structural Steel Co.

NEW YORK, 2700 tons, loft building on West Thirtieth Street, to Hedden Iron Construction Co.

BROOKLYN, 325 tons, platform extensions for the Brooklyn-Manhattan Transit Co., to Fort Pitt Bridge Works.

LONG BEACH, N. Y., 675 tons, addition to hotel, to Owego Bridge & Iron Co.

PATERSON, N. J., 450 tons, highway bridge, to McClintic-Marshall Co.

CLINTON, N. J., 275 tons, highway bridge over Raritan River, to Bethlehem Steel Corporation.

PERTH AMBOY, N. J., 200 tons, Kresge 5 and 10-cent store, to the Hoefner Co.

PHILADELPHIA, 325 tons, Rising Sun Avenue bridge, to American Bridge Co.

PHILADELPHIA, 450 tons, Jeannes Hospital, to McClintic-Marshall Co.

PHILADELPHIA, 425 tons, building for Sesqui-Centennial Exposition, to Shoemaker Bridge Co.

PHILADELPHIA, 430 tons, factory building for John W. Watson Co., to Fort Pitt Bridge Works.

PENNSYLVANIA RAILROAD, 400 tons, bridge in Ohio, to McClintic-Marshall Co.

DELAWARE, LACKAWANNA & WESTERN RAILROAD, 950 tons, bridges, to American Bridge Co.

HARTFORD, CONN., 325 tons, theater, to Belmont Iron Works.

BOSTON, 1000 tons, apartment hotel Arlington and Newbury Streets, to New England Structural Co.

MONTEVIDEO, 400 tons, Ford Motor Co., Stone & Webster, Inc., Boston, to Lehigh Structural Steel Co.

PORTLAND, ME., 600 tons, Congress Square Hotel, to Lehigh Structural Steel Co.

LEHIGH VALLEY RAILROAD, 200 tons, bridge, to an unnamed fabricator.

ROCHESTER, N. Y., 400 tons, Stromberg-Carlson Telephone Co., to Genesee Bridge Co.

BEAVER FALLS, PA., 600 tons, hotel, to Fort Pitt Bridge Works.

MCKEESPORT, PA., 100 tons, McKeesport Tin Plate Co., storage and carpenter shop, to Jones & Laughlin Steel Corporation.

LOUISVILLE & NASHVILLE RAILROAD, 1470 tons, bridge over Wabash River, to American Bridge Co.

GEORGIA-SOUTH CAROLINA, 350 tons, highway bridge across border, to an unnamed fabricator.

ALABAMA POWER CO., 175 tons, towers, to American Bridge Co.

TOLEDO, 765 tons, factory building for Electric Auto Lite Co., to Massillon Bridge & Structural Co., previously reported as awarded to unnamed fabricator.

CINCINNATI, 1030 tons, Fountain Theater, to J. E. Moss Iron Works.

MEMPHIS, TENN., 400 tons, building for Memphis Steam Laundry, to Pidgeon-Thomas Iron Co., Memphis.

BIRMINGHAM, 800 tons, bridge for Dixie Construction Co., to Virginia Bridge & Iron Co.

IOWA CITY, IOWA, 150 tons, heating plant for University of Iowa, to Des Moines Steel Co.

GREAT NORTHERN RAILWAY, 300 tons, flanged steel plates, forgings and castings for two cylinders to be installed at creosoting plant at Somers, Mont., to Puget Sound Machinery Depot, Seattle, Wash.

MILWAUKEE, 725 tons, third unit Central Continuation School, to Worden-Allen Co.

GREEN BAY, WIS., 700 tons, power house for Wisconsin Public Service Co., to Lakeside Bridge & Steel Co.

WYOMING, 225 tons, United States Reclamation Service, McKay dam at American Falls, to Lakeside Bridge & Steel Co.

Structural Projects Pending

Inquiries for fabricated steel work include the following:

NEW YORK, 12,000 tons, Salmon Building, Forty-second Street, adjoining Aeolian Hall.

NEW YORK, 200 tons, taxicab ramp at Pennsylvania Station.

NEW YORK CENTRAL, 450 tons, bridge reinforcement.

STATE OF MAINE, 7500 tons, bridge over the Kennebec River.

BOSTON, 400 tons, widening of Tremont Street bridge.

HUDSON, MASS., 300 tons, factory extension for Firestone Rubber Co.

WALPOLE, MASS., 165 tons, school.

FOXBORO, MASS., 400 tons, manufacturing plant, Foxboro Co.

CONNECTICUT, 1000 tons, gas holder.

TRENTON, N. J., 450 tons, Masonic Temple.

CAMDEN, N. J., 650 tons, highway bridge.

TAMPA, FLA., 400 tons, highway bridge.

MICHIGAN, 4500 tons, gas holder.

ASHLAND, KY., 300 tons, building for American Rolling Mill Co.; bids opened.

ST. LOUIS, 1000 tons, 20 small steel barges for U. S. Engineer's Office, 428 Customhouse; bids close March 31.

MINNEAPOLIS, 400 tons, Lutheran Church.

HOUSTON, TEX., 3000 tons, oil tankage.

Japanese Railroads Buy

Purchases of Rails by Japan Principal Feature in Exports—British Low on Sheets and Tin Plate

NEW YORK, March 16.—Demand from foreign markets for iron and steel continues small. Cuban purchasers are inclined to buy on the lower Continental prices they are able to secure, and much of the current business from South American markets is evidently going to European mills. Japanese buying of rails, some of which business is coming to the United States, is about the only outstanding feature of the market. On light gage black sheets, British makers are reported quoting down to about $80 per ton, c.i.f. Japan, which is $1.50 to $2 under the lowest price obtainable from American mills. What wire rod business has appeared in the past few weeks has been placed with Canadian mills with a few exceptions. On tin plate, mills in the United States are quoting $5.50 to $5.75 per base box, c.i.f. Japan, while Welsh tin plate is quoted as low as $5.20 c.i.f. Japan, according to Japanese reports.

Of the recent railroad business that has been in the market from Japan, the largest award was the 5400 tons of 100-lb. rails and about 300 tons of splice bars placed by the Imperial Government Railways in the United States with the leading interest through the Mitsubishi Shoji Kaisha. The seller is reported to have

met the Continental price that was submitted. Another recent purchase by a large Japanese railroad is an order for about 200 tons of car and locomotive building material placed by the South Manchuria Railway Co. with Suzuki & Co., New York. The 15 miles of 75-lb. rails for the Nankai Electric Tramway have not yet been awarded.

Importers of European steel in the United States continue active on small lot orders of reinforcing and plain steel bars, hoops and bands, barbed wire and structural material. The large mail order houses recently reported as negotiating for barbed wire have not yet closed, evidently being unwilling to pay the importers' quotation of 3c. per lb., c.i.f. duty paid for barbed wire. One importer in New York is reported to have recently closed a sizable tonnage of bands. Circumstantial reports indicate the purchase of 15,000 tons of rails by the Boston & Maine from the Krupp company in Germany.

RAILROAD EQUIPMENT

Freight Car Orders Negligible, But Inquiries Call for 1600 Cars

Only 400 freight cars were ordered by railroads within the past week, but inquiries for 1600 were sent out. Nineteen locomotives were ordered and a new inquiry is for 30 for the Wabash. The principal items of the week follow:

The Southern Railway placed 1000 center sill reinforcements with the Virginia Bridge & Iron Co.

The Illinois Central placed 200 automobile cars and 3 diners with the Pullman Car & Mfg. Corporation, and 5 baggage cars with the American Car & Foundry Co. It also bought from the Pullman Car & Mfg. Corporation 6 coaches for the Central of Georgia. The 5 baggage club cars inquired for will not be purchased at this time.

The Wabash is in the market for 30 locomotives.

The Pennsylvania, mentioned last week as inquiring for 100 to 200 locomotives, may authorize as many as 300, 100 of which will be built in its own shops and 200 in outside shops.

The Chicago, Rock Island & Pacific has ordered 10 Mikado type and 5 mountain type locomotives from the American Locomotive Co.

The American Locomotive Co. has booked the following orders: Standard Slag Co., 1 four-wheel tank locomotive; Tennessee Coal, Iron & Railroad Co., 1 six-wheel switching engine; Longview, Portland & Northern Railroad, 2 Mikado type locomotives.

The Central of New Jersey is inquiring for 1000 box cars of 50 tons capacity and 100 gondola cars.

The North American Car Co. is in the market for 500 tank cars.

The Imperial Refining Co., Tulsa, Okla., has ordered 100 tank cars from the Pennsylvania Car Co.

The Missouri Pacific has ordered 600 box car bodies from the Pennsylvania Car Co.

The Colorado & Southern placed 100 ballast cars with the Rodger Ballast Car Co.

Witherbee, Sherman & Co. Readjustment

A readjustment of the affairs of Witherbee, Sherman & Co., 2 Rector Street, New York, owners of two blast furnaces at Port Henry, N. Y., and a half interest in the Port Henry Iron Ore Co., has been undertaken by Dillon, Read & Co. and Kean, Taylor & Co., New York banking houses representing the bondholders; the National City Bank of New York, which holds $1,500,000 of the company's notes; and the stockholders. E. O. Marting, formerly of the Marting Iron & Steel Co., Ironton, Ohio, has been selected to manage the business. L. W. Francis has been president of the company for some years.

James H. Perkins, president of the Farmers' Loan & Trust Co., New York, has been appointed to represent the bondholders on a committee of three to readjust the company's affairs, the other two members being Gordon S. Rentschler, vice-president of the National City Bank, and Spottswood D. Bowers of Laughlin, Gerard, Bowers & Halpin, a New York law firm, the latter representing the stockholders. These will elect a new board of directors.

The essentials of the financing plan include the raising of $500,000 additional working capital by stockholders and they will receive five-year notes ranking junior to the first mortgage bonds; the National City Bank has agreed to accept a five-year note for $1,500,000, this also ranking junior to the first mortgage bonds, and stock representing control of the company will be placed in the hands of a voting trust, which shall consist of the representatives above mentioned of the three groups—bondholders, stockholders and the National City Bank. First mortgage bondholders, in order to effect this rehabilitation, have been asked to agree to suspension of the operation of the sinking fund for a period of five years.

In a letter to holders of the first mortgage bonds urging them to agree to the above plan, attention is called to the difficulties through which the pig iron industry has passed in the last few years with the added comment that "a noticeable improvement in the industry has recently taken place."

REINFORCING STEEL

Awards for the Week in Excess of 2500 Tons, While New Work Totals 5190 Tons.

An addition to Gimbel Brothers' store, Philadelphia, will take 1000 tons of reinforcing bars, which will be furnished by the Truscon Steel Co. Other awards bring the week's total up to 2515 tons. The largest job pending is a Bush Terminal warehouse addition in Brooklyn, requiring 1800 tons. The total of pending work is 5190 tons. Awards follow:

WELLSVILLE, N. Y., 250 tons, metal lumber and bars, to General Fireproofing Co.

EVANSTON, ILL., 125 tons of rail steel for the Paul Finley Apartment, to Calumet Steel Co.

CHICAGO, 135 tons, Northwestern University Library and Law School building, to Truscon Steel Co.

CHICAGO, 325 tons, Chicago & Western Indiana Lawrence Avenue subway, to Truscon Steel Co.

CHICAGO, 400 tons, Lake Street and Michigan Boulevard office building, to Olney J. Dean & Co.

PHILADELPHIA, 1000 tons, addition to Gimbel Brothers store, to Truscon Steel Co.

HARTFORD, CONN., 280 tons, plant, Brainerd Printing Co., to Truscon Steel Co.

Reinforcing Bars Pending

Inquiries for reinforcing steel bars include the following:

GARY, IND., 150 tons, Knights of Columbus building; McNally & Quinn, architect.

CHICAGO, 100 tons, Independent Order of Vikings; S. A. Lundgren, general contractor.

CHICAGO, 860 tons, Davis Hotel, Walton Place near Michigan Boulevard.

CHICAGO, 800 tons, addition to Cook County Hospital.

CHICAGO, 400 tons, Roosevelt High School.

CHICAGO, 150 tons, Roanoke Building; general contract awarded to Dahl-Stedman Co.

BROOKLYN, 1800 tons, warehouse addition, Bush Terminal.

BROOKLYN, 140 tons, factory, Keystone Varnish Co.

WORCESTER, 190 tons, warehouse for Firestone Tire & Rubber Co.

CLEVELAND, 400 tons, tower building for Union Terminals Co.

CLEVELAND, 200 tons, Kerr Garage.

Marketing will be discussed at a meeting of the metropolitan section of the Taylor Society, to be held at the Town Hall Club, New York, April 15. Willard Freeland, professor of marketing, Massachusetts Institute of Technology, will be the principal speaker.

NON-FERROUS METALS

The Week's Prices

Cents per Pound for Early Delivery

	Copper, New York		Straits Tin (Spot)	Lead		Zinc	
March	Lake	Electrolytic*	New York	New York	St. Louis	New York	St. Louis
10.....	14.25	13.95	64.62½	8.40	8.10	7.70	7.35
11.....	14.25	13.90	65.00	8.35	8.05	7.65	7.30
12.....	14.25	13.87½	65.25	8.20	8.00	7.62½	7.27½
13.....	14.25	13.87½	....	8.20	8.00	7.65	7.30
15.....	14.25	13.87½	65.00	8.20	8.00	7.65	7.30
16.....	14.25	13.95	66.00	8.20	8.00	7.70	7.35

*Refinery quotation; delivered price ¼c. higher.

New York

NEW YORK, March 16.

All the markets are dull except tin, in which buying has been fairly large and prices have advanced to new high levels. Continued activity in copper has resulted in lower prices which have stiffened today. Further reductions in lead have featured that market. The zinc market is sluggish and prices have again declined.

Copper.—The aloofness of consumers from the market during the week has had the usual result and, when any copper had to be bought, it brought lower prices than those of the leading producers. Most of these have been maintaining a quotation of 14.20c. to 14.25c., delivered, but moderate quantities have been sold by one or two other interests as low as 14.12½c., delivered. Yesterday and today London dealers became more active and prices advanced slightly over there, so that the tone here is a little better and prices a little stronger. The minimum today is 14.20c., delivered. One indication of the buying power underlying the market is the statement by one seller that at least 7,000,000 lb. could be placed today if it could be obtained at 14.12½c. Producers in general report that specifications of mills on contract for March metal are unprecedented and that they are convinced that considerable April-May delivery is yet to be purchased. Lake copper is quoted at 14.25c., delivered. The statistics for February, which showed a moderate increase in stocks of refined metal, had no particular effect on the market.

Tin.—The highest price in many, many months was reached last week. At 65.25c., New York, spot Straits tin on Friday, March 12, exceeded any price since 1920. This advance was due more to sustained buying than to speculation. For the week ended March 13 at least 1100 to 1200 tons was sold, with consumers the principal buyers and the deliveries spread over March, April, May. Yesterday buying was again good at something over 300 tons and today a fair business was done with the quotation at 66c., New York. Sales were made at this high level. Despite the extremely unsatisfactory conditions in Europe, the showing of the market here is unusually strong. Prices in London today were about £5 per ton higher than a week ago, with spot standard quoted at £297 12s. 6d., future standard at £288 15s. and spot Straits at £297 17s. 6d. The Singapore price was £288 5s. Arrivals thus far this month were 2965 tons, with 5010 tons reported afloat.

Lead.—For the third consecutive week two more reductions have been made by the American Smelting & Refining Co. on its contract quotations, making six in all. On March 10 the reduction was from 8.60c. to 8.40c., New York, and on March 12 from 8.40c., to 8.20c. On March 11 the outside market cut the price to 8.35c. With lead now selling at 8c., St. Louis, and 8.20c. to 8.35c., New York, depending on the seller, an active demand has sprung up and fairly good sales have been made. The closing down of the Australian mines because of drought will probably strengthen the London market, where there is a premium on futures of about 10s. per ton with an over supply of spot metal. If the Australian situation fails to strengthen the London market, our market will continue low, but a better tone prevailed here yesterday and today. Consumers, who had been holding off, are more active.

Zinc.—The situation has changed but little except that prices have sagged, going as low as 7.25c. to 7.30c., St. Louis, on March 12. The statistics for February were only a moderate factor, showing an increase of over 6000 tons in stocks with production about 3500 tons less than in January. Today, because of a little better inquiry, the market is a little higher at 7.35c., St. Louis, or 7.70c., New York.

Nickel.—Wholesale lots of ingot nickel are quoted at 35c., with shot nickel at 36c., and electrolytic nickel at 39c. per lb.

Antimony.—The market is decidedly easier, quite inactive and lower. Chinese metal for spot and early delivery is quoted at 17c., New York, duty paid, with March-April arrival at about the same price. March-April shipment from China is quoted also at 17c., duty paid.

Aluminum.—Virgin metal, 98 to 99 per cent pure, is obtainable as ingots at 27c. to 28c. per lb., delivered.

Old Metals.—Values are somewhat unsettled and business is spotty. Dealers' selling prices, in cents per lb., are as follows:

Copper, heavy and crucible	13.75
Copper, heavy and wire	13.00
Copper, light and wire	11.75
Heavy machine composition	10.00
Brass, heavy	9.00
Brass, light	7.75
No. 1 red brass or composition turnings	9.00
No. 1 yellow rod brass turnings	9.25
Lead, heavy	7.25
Lead, tea	6.25
Zinc	5.00
Cast aluminum	19.50
Sheet aluminum	19.50

Chicago

MARCH 16.—This market is slightly more active than during the previous week. Tin has advanced rather sharply in a market influenced by a relatively high demand as compared to the available supply. Lead, zinc and antimony are not in great demand and current prices are lower. The old metal market is very quiet and prices, with the exception of lead pipe, remain unchanged. We quote, in carload lots: Lake copper, 14.35c.; tin, 66c.; lead, 8.10c.; zinc, 7.40c.; in less than carload lots, antimony, 20.50c. On old metals we quote copper wire, crucible shapes and copper clips, 10.25c.; copper bottoms, 9.25c.; red brass, 9c.; yellow brass, 8c.; lead pipe, 6.50c.; zinc, 5c.; pewter, No. 1, 37c.; tin foil, 44c.; block tin, 52c.; aluminum, 19.50c.; all being dealers' buying prices for less than carload lots.

Non-Ferrous Rolled Products

Prices on brass, bronze and copper products have remained unchanged since they were advanced ¼c. per lb. as of Feb. 5, except copper wire which was reduced ¼c. this week. Zinc sheets have not been changed in 12 weeks. Lead full sheets have been reduced ½c. per lb. For New York warehouse prices see page 830.

List Prices Per Lb., f.o.b. Mill

On Copper and Brass Products, Freight Up to 75c. Per 100 Lb. Allowed on Shipments of 500 Lb. or Over

Sheets	
High brass	19¼c.
Copper, hot rolled	22¾c.
Zinc	12c.
Lead (full sheets)	12¼c.
Seamless Tubes	
High brass	23¾c.
Copper	24½c.
Rods	
High brass	16¾c.
Naval brass	19⅝c.
Wire	
Copper	16¼c.
High brass	19⅝c.
Copper in Rolls	21⅝c.
Brazed Brass Tubing	27⅛c.

Aluminum Products in Ton Lots

The carload freight rate is allowed to destinations east of the Mississippi River and also allowed to St. Louis on shipments to destinations west of that river.

Sheets, 6 to 10 gage, 3 to 30 in. wide	37½c.
Tubes, base	48c.
Machine rods	34c.

PERSONAL

Thomas H. Wickenden, development and research department, International Nickel Co., New York, will address the St. Louis chapter of the American Society for Steel Treating, Friday evening, March 19, at the American Annex Hotel, taking as his subject "Automobile Design and Automotive Steels." He will present different methods of determining whether a carbon or alloy steel should be used and what heat treatment should be applied.

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A. R. Kennedy, traffic manager Pittsburgh Steel Co., Pittsburgh, has been tendered and has accepted the chairmanship of the traffic council of the Chamber of Commerce of Pittsburgh, which is being reorganized and will hold an organization meeting at the Chamber of Commerce on April 2.

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J. I. Andrews, general manager of sales American Sheet & Tin Plate Co., Pittsburgh, has gone to Florida for a brief vacation.

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K. H. Marsh has been named chief engineer at the plant of the Wickwire Spencer Steel Co., Inc., Buffalo.

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C. S. Simon has been placed in charge of the Mid-Continent office in Tulsa, Okla., of the Midwest Piping & Supply Co., St. Louis, industrial and power plant piping. For the last 2½ years he has been master mechanic at the Wood River Refinery of the Roxana Petroleum Corporation. For seven years he was construction engineer with the Pacific Gas & Electric Co. He also had one year as field engineer for the Petroleum Rectifying Co.

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William O. Lange has been appointed general manager of sales of the Phoenix Iron Co., 22 South Fifteenth Street, Philadelphia, whose structural steel plant is at Phoenixville, Pa. Mr. Lange has been connected with the Phoenix Iron Co. for 23 years, all of which time he has been in the sales department except for a period during the war, when he served in the army. For a number of years he has been acting as assistant general manager of sales.

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F. M. Fuller, assistant general manager of sales American Sheet & Tin Plate Co., Pittsburgh, is back at his desk after an absence of several weeks, due to illness.

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P. G. Johnson, formerly manager of the Boeing Airplane Co., Seattle, has been made president of the company, succeeding William E. Boeing, made chairman of the board of directors. C. L. Egtvedt, chief engineer, has been made first vice-president and George P. Titmarsh, headquarters in Washington, D. C., has been made vice-president, and will remain in Washington.

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William P. Ross succeeds R. T. Lane, sales manager Standard Tool Co., Cleveland, effective April 1. Mr. Ross is a native of Cleveland and when a youth secured employment with the company. After working his way through various plant departments he was made New England representative, with headquarters in Boston, a position he has held for 19 years. L. C. White, who has served as assistant to Mr. Ross for the past six or seven years, will represent the company in Southern New England and Vermont, and H. L. Elder, in the remainder of the New England territory.

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J. W. Dolton, metallurgist and director of research of Frank Foundries Corporation, Moline, Ill., addressed the Quad-City Foundrymen's Association at Rock Island, Ill., March 15, on "Relationships Between the Structure and Mechanical Properties of Cast Iron."

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Frank D. Hoerle, for the past six years with Hickman, Williams & Co., pig iron, coke and ferroalloys, in the New York and Philadelphia offices, has joined the sales organization of E. Arthur Tutein, Inc., 52 Vanderbilt Avenue, New York, and will handle New York City and northern New Jersey territory in the sale of pig iron, coke, etc. Mr. Hoerle received his early business training under J. Leonard Replogle at the plant of the Cambria Steel Co., Johnstown, Pa., and later was assistant general manager of sales of the Donner Steel Co., Buffalo. E. Arthur Tutein, Inc., is sales agent for the pig iron and coke of the Hudson Valley Coke & Products Corporation, whose new furnace at Troy, N. Y., will soon be in blast.

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James W. Galvin has resigned as superintendent of steel works, Steubenville plant, Wheeling Steel Corporation, to give his attention to personal interests in Chicago.

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D. A. Currie, vice-president and general manager Erie Foundry Co., Erie, Pa., will sail on the Aquitania March 20 for a business trip to France, Italy, Belgium, Germany, England and Scotland.

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Charles M. Schwab returned last week from a trip to Europe.

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Warren J. Davis, chairman board of directors and treasurer J. I. Case Threshing Machine Co., Racine, Wis., has resigned and departed March 11 on an extended trip abroad. He retains a directorship in the corporation. Leon R. Clausen, president of the Case company, has been elected treasurer.

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William A. Edwards, branch manager of the Chicago territory for the Ludlum Steel Co., Watervliet, N. Y., has been transferred to take charge of the Southwestern territory, with headquarters at Houston, Tex.

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Paul D. Foote, who delivered the annual lecture before the Institute of Metals Division of the American Institute of Mining and Metallurgical Engineers at the annual February convention, was graduated from Adelbert College of Western Reserve University, Cleveland, with the degree of A.B. in 1909. He received his M.A. from the University of Nebraska in 1911 and his degree of doctor of philosophy from the University of Minnesota in 1917. He is a physicist at the United States Bureau of Standards, where he was in charge of pyrometry from 1911 to 1923 and in charge of X-ray investigations, radio activity, atomic structure since 1923. He is a fellow of the American Physical Society and a member of the French and German physical societies. He is editor-in-chief of the *Journal of the Optical Society of America* and the *Review of Scientific Instruments*, and an associate editor of the *Journal* of the Franklin Institute. Among his publications may be mentioned "Pyrometric Practice," "The Origin of Spectra" and about 100 scientific articles on atomic physics and pyrometry.

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John D. Capron, research engineer United States Cast Iron Pipe & Foundry Co., gave an address, accompanied by motion pictures, on centrifugal casting of iron pipe at a meeting of the Engineering Society of Western Massachusetts at Hotel Highland, Springfield, Monday evening, March 8.

To Standardize Washers and Pins

Plans for the standardization of plain and lock washers will be discussed at an organization meeting to be held at the Engineering Societies Building, 29 West Thirty-ninth Street, New York, on Friday, March 19 at 10 a. m. The American Society of Mechanical Engineers and the Society of Automotive Engineers are the sponsor bodies.

On the same day and place, but at 2 p. m., there will be an organization meeting to develop plans for the standardization of machine pins. This meeting is held under the same auspices.

OBITUARY

CLARK L. WILCOX, managing partner and treasurer, Pitt Construction Co., Pittsburgh, died at his home in that city March 11. He had been active in steel construction work in the Pittsburgh district since his graduation from Cornell University in 1901. He was born in Mexico, N. Y., 48 years ago.

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W. S. BURT, secretary Pacific Coast Steel Co., San Francisco, died at his home in Seattle, Wash., March 7, in his sixty-fifth year. Mr. Burt was a prominent figure in the iron and steel business on the Pacific Coast, particularly in the Pacific Northwest, for the past 30 years. He was a former resident of Youngstown, Ohio. With Judge E. M. Wilson, president Pacific Coast Steel Co., he helped establish the first plant of that company in 1895 at Lakeville, Wash. Mr. Burt was a member of the Masonic fraternity, a Knight Templar and a noble of the Mystic Shrine.

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CLINTON EDWIN HOBBS, C. E. Hobbs Co., Boston, chains and chain hoists, died at his home in Everett, Mass., Friday, March 5, in his fifty-ninth year. Mr. Hobbs was a former president of the Everett board of aldermen and at one time a candidate for mayor. During the funeral services on March 9 the flags of the city were placed at half staff.

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WILLIAM LOUIS COOP, co-founder of the Narragansett Machine Co., Providence, died at his home in that city Friday, March 5, following a long illness. He was born in Providence 70 years ago.

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LOUIS RICHARD STILLE, for 46 years associated with the Battis Boiler Works, Oshkosh, Wis., and for 30 years half owner of the business, died March 6 at the age of 60 years. He entered the shop as an apprentice when 15 years of age.

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GEORGE H. GANSON, president Dover Fire Brick Co., Cleveland, died suddenly March 10, at the age of 61 years.

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J. ROSSITER HOYLE, a director of Thomas Firth & Sons, Ltd., Sheffield, England, died March 14, at the age of 70 years. Mr. Hoyle was a prominent resident of Sheffield and in 1912 and 1913 was recipient of the honorary title "Master Cutler," given each year to a leading citizen of Sheffield connected with the steel trade. He was elected a member of the Iron and Steel Institute in 1884 and was also a member of the Institution of Civil Engineers and the Institution of Mechanical Engineers.

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LOUIS LESSIG, Pottstown, Pa., died on Monday, March 15. He was a son of George B. Lessig, deceased, of the George B. Lessig Co., Pottstown, for many years maker of cut nails and puddled iron, the business having been sold some years ago to the Reading Iron Co.

Make Final Plea for Advance Rates

CHICAGO, March 16.—The final plea for an early decision on the application of Western railroads for a 5 per cent increase in freight rates was made before the Interstate Commerce Commission, March 9. As a remedy for the failure of the present rate structure to produce adequate revenue, the carriers suggest an advance in freight rates of 5 per cent, with modifications with respect to particular commodities for the purpose of preserving rate relationships and with stated exceptions for certain trans-continental rates. On the basis of 5 per cent of a total freight revenue of $1,655,043,426 in the Western district in 1924, the advance, according to the brief, would produce approximately $80,000,000 in added revenue, assuming advances in both interstate and intrastate rates.

American Locomotive Co. and Railway Steel Spring Co. to Merge

The boards of directors of the American Locomotive Co. and the Railway Steel Spring Co. have approved a merger of the two companies and meetings of the stockholders have been called to ratify this action. The stockholders in the American Locomotive Co. will be asked to increase both the preferred and common capital stock of the company so that there will be a sufficient amount of new securities for an exchange of stock on the following basis: one share of preferred stock in the American Locomotive Co. for each share of preferred stock of the Railway Steel Spring Co. and two-thirds of a share of Locomotive's common stock for each single share of Railway Steel Spring common stock.

William H. Woodin, who is president of the American Locomotive Co., as well as president of the American Car & Foundry Co., will become chairman of the board of directors of the enlarged American Locomotive Co., and Frederick F. Fitzpatrick, president Railway Steel Spring Co., will become president of the American Locomotive Co.

The largest shareholders of both companies have already agreed to the merger and complete ratification is looked for. This action will bring together under one control the largest railroad equipment manufacturing organization in the country, including not only the American Locomotive Co., the Railway Steel Spring Co., and the American Car & Foundry Co., but also the J. G. Brill Corporation, Philadelphia, manufacturer of street cars, the Hall-Scott Motors Co., manufacturer of motors, and the Fageol Motors Corporation, manufacturer of buses. These latter three companies were recently brought together as a subsidiary of the American Car & Foundry Co. The new organization will cover the entire transportation field, including locomotives, railroad cars, street railroad cars and motor buses.

Stanley Works Acquires German Plant

The Stanley Works, New Britain, Conn., has purchased a plant in Velbert, a small hardware manufacturing city near Dusseldorf, Germany. It was formerly owned and built up by Friedr. Carl von Bruck, and the business, a development of 20 years, covered various lines of butts, hinges, bolts, etc., many similar to or identical with the lines manufactured by the Stanley Works for sale in foreign countries. For the past few years they have been competitors in these markets. They also manufacture a full line of these goods which are sold very largely in the home markets of Germany and the near Eastern countries.

The plant consists of about 30 acres of land and buildings of recent construction and good modern machinery. At the present time it employs about 300 and C. F. Bennett, president of the Stanley Works, believes it will be a valuable addition in the development of some of the export fields.

John E. Cairns, of the Stanley Works, is in charge of the German plant. He was graduated from Yale and the Harvard School of Business Administration.

More Than 38,000 Bethlehem Employees Have Bought Stock

E. G. Grace, president Bethlehem Steel Corporation, has announced that, under this year's savings and stock ownership plan, 38,473 employees have applied for a total of 76,536 shares of 7 per cent preferred stock of the corporation at $101 per share.

This number of shares is equivalent to over 15.7 per cent of the total amount of 7 per cent preferred stock outstanding on Dec. 31, 1925. The employees applying this year constitute over 60 per cent of the total number of employees in the corporation. At the Lackawanna plant near Buffalo 90 per cent of the employees applied for stock. The stock plan was inaugurated in 1924 to encourage thrift in the employees and to stimulate their interest in the corporation.

German Mills Quote Lowest Prices

Competition Weakens French and Belgian Steel Markets—Continental and British Pig Iron Still Strong

(*By Cable*)

LONDON, ENGLAND, March 15.

PIG IRON is quiet but steady with only a small available supply. The engineering outlook is brighter but consumers generally lack confidence and are confining their purchases to immediate requirements. Hematite is dull and prices easier with some makers in need of orders. Foreign ore is quiet. Bilbao Rubio is quoted at 21s. 3d. to 21s. 6d. c.i.f. Tees.

Northeastern mills have sold 12,000 tons of ship plates to Clyde shipyards. There is a moderate domestic demand for finished iron and steel but export sales are still poor. Mills rolling structural shapes and rails as well as most engineering plants are actively employed.

February exports of pig iron totaled 35,534 tons, of which 9951 tons went to the United States. The total exports of iron and steel were 339,474 tons.

Tin plate is dull with sales down to 19s. 3d. per base box, f.o.b. works, made by some mills. The general quotation, however, is 19s. 4½d. base and upward. Shipments are improving. February exports of tin plate were 47,635 tons. Galvanized sheets are quiet but prices continue fairly firm at recent levels. Exports are maintained at a high level with 68,630 tons shipped in February, of which India took 28,927. Black sheets are dull and prices unchanged.

Continental markets show a downward tendency in the absence of any substantial demand and with the continued depreciation of the franc.

French Politics Depress Market

No Inclination to Contract Ahead with Uncertain Future Costs and Current Price Weakness

PARIS, FRANCE, Feb. 26.—The continued uncertainty as a result of the political turmoil over passage of a tax bill, is exercising a depressing effect on the iron and steel industry. The further decline of the franc in international exchange and the impossibility of even estimating how much of a tax will have to be eventually taken into consideration with the attendant effect upon costs is begetting more caution in both buying and selling. The result is a tendency to buy from hand-to-mouth, mills being unwilling to commit themselves on much forward business and consumers being satisfied to cover their immediate requirements.

Pig iron.—The recent demand of foundry consumers for an increase in the tonnage available for March delivery has resulted in producers advancing the allotment for domestic consumption for March by 5000 tons with 10,000 tons more held in reserve. This brings the total of iron at the disposal of foundry consumers since Jan. 1 to between 155,000 and 165,000 tons. Accompanying the increase of tonnage the March price has been advanced 12.50 fr. per metric ton to 407.50 fr. ($14.83). No. 3 foundry P. L. has been increased 3 fr. per metric ton. Increases of about 3 fr. per ton for the silicon content of iron have been made. The advance covers the expected rise in the price of coke. Semi-phosphoric iron, containing about 1 per cent phosphorus is increased from 420 fr. ($15.28) per metric ton to 437.50 fr. ($15.82) for March. Export demand has been good and the market in Antwerp is steady. Hematite is strong and consumers are expected to dispose of about 10,000 tons during March.

Semi-finished material.—Prices are unchanged and domestic demand continues in fair volume. For export the available supply is smaller than recently, but weakness in blooms continues. Billets are held at £4 9s. to £4 9s. 6d. per metric ton ($21.63 to $21.75), blooms at £4 1s. 6d. to £4 2s. per metric ton ($19.68 to $19.93) and slabs at £4 14s. to £4 15s. per metric ton ($22.84 to $23.08), all f.o.b. Antwerp.

Finished products.—Works are fairly well booked for the next two or three months, but the uncertainty of future costs is making the market quiet. Demand

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British and Continental European prices per gross ton, except where otherwise stated, f.o.b. makers' works, with American equivalent figured at $4.86 per £ as follows:

Durham coke, del'd	£0	19s.	to	£0	19½s.	$4.62	to	$4.73
Bilbao Rubio ore†	1	1½				5.22		
Cleveland No. 1 fdy.	3	12½	and	3	13*	17.62	and	17.74*
Cleveland No. 3 fdy.	3	10	and	3	10½*	17.01	and	17.13*
Cleveland No. 4 fdy.	3	9	and	3	9½*	16.77	and	16.88*
Cleveland No. 4 forge	3	8	and	3	8½*	16.52	and	16.65*
Cleveland basic	3	10	and	3	10½*	17.01	and	17.13*
East Coast mixed	3	17	to	3	17½	18.71	to	18.83
East Coast hematite	4	19				24.06		
Ferromanganese	15	10				75.33		
*Ferromanganese	15	5				74.12		
Rails, 60 lb. and up	7	5	to	8	0	35.24	to	38.88
Billets	6	0	to	7	10	29.16	to	36.45
Sheet and tin plate bars, Welsh	6	5				30.38		
Tin plates, base box	0	19¼	to	0	19¾	4.68	to	4.80
						C. per Lb.		
Ship plates	7	0	to	7	10	1.52	to	1.62
Boiler plates	11	0	to	11	10	2.39	to	2.49
Tees	7	5	to	7	15	1.57	to	1.68
Channels	6	10	to	7	0	1.41	to	1.52
Beams	6	5	to	6	15	1.35	to	1.46
Round bars, ¾ to 3 in.	7	15	to	8	5	1.68	to	1.79
Steel hoops	10	10	and	11	0*	2.28	and	2.39*
Black sheets, 24 gage	11	5	to	11	10	2.35	to	2.49
Black sheets, Japanese specifications	14	15				3.19		
Galv. sheets, 24 gage	15	17½	to	16	5	3.44	to	3.52
Cold rolled steel strip, 20 gage	18	0				3.91		

*Export price.

†Ex-ship, Tees, nominal.

Continental Prices, All F. O. B. Channel Ports

Foundry pig iron:(a)								
Belgium	£3	2s.	to	£3	4s.	$15.06	to	$15.55
France	3	2	to	3	4	15.06	to	15.55
Luxemburg	3	2	to	3	4	15.06	to	15.55
Basic pig iron:(a)								
Belgium	3	0	to	3	2	14.58	to	15.06
France	3	0	to	3	2	14.58	to	15.06
Luxemburg	3	0	to	3	2	14.58	to	15.06
Coke	0	18				4.37		
Billets:								
Belgium	4	7½	to	4	10	21.26	to	21.87
France	4	7½	to	4	10	21.26	to	21.87
Merchant bars:						C. per Lb.		
Belgium	5	5	to	5	10	1.15	to	1.21
Luxemburg	5	5	to	5	10	1.15	to	1.21
France	5	5	to	5	10	1.15	to	1.21
Joists (beams):								
Belgium	4	17½	to	5	2½	1.07	to	1.13
Luxemburg	4	17½	to	5	2½	1.07	to	1.13
France	4	17½	to	5	2½	1.07	to	1.13
Angles:								
Belgium	5	2	to	5	4	1.12	to	1.15
⅛-in. plates:								
Belgium	6	0	to	6	2	1.32	to	1.34
Germany	6	0	to	6	2	1.32	to	1.34
¼-in. ship plates:								
Belgium	5	11	to	5	13	1.22	to	1.24
Luxemburg	5	11	to	5	13	1.22	to	1.24
Sheets, heavy:								
Belgium	6	3	to	6	4	1.35	to	1.37
Germany	6	3	to	6	4	1.35	to	1.37

(a) Nominal.

for beams is beginning to revive but prices are still unsteady. In the East beams are quoted at 640 to 680 fr. per metric ton ($23.30 to $24.75) and large angles at 670 to 700 fr. per metric ton ($24.38 to $25.48). Recently, however, concessions have been made, some of them rather substantial. Exports of beams have been good, but German competition is beginning to be felt. Exporters point out that German mills are quoting as low as £4 16s. 6d. ($23.45) f.o.b. Hamburg, while the Antwerp price of French makers is 1s. per ton higher. German competition on steel bars has introduced some weakness into the export market, the German quotation of £5 4s. 6d. per ton ($25.40) also being 1s. less than the previous French market price.

Rails.—The January exports of rails were considerably larger than the December shipments. A recent sale of 2750 metric tons of 60-lb. sections to a Central African railroad brought out a price of 655 fr. per metric ton ($23.85) f.o.b. French port.

Sheets.—There has been no appreciable change in the sheet market except for slightly greater steadiness in prices. German competition is felt on export sales, but the price is fairly firm on medium gage sheets at £5 19s. per metric ton ($28.82) f.o.b. Antwerp.

Belgian Steel Prices Weaken

German Export Prices on Finished Steel About One Shilling Per Ton Lower—Pig Iron Strong

ANTWERP, BELGIUM, Feb. 27.—Although there has been no substantial change in the market, there is more decided evidence of weakness as a result of the uncertainty caused by the lack of demand. Much of this weakness in prices is largely a result of the return of German makers to competition for foreign business. The Charleroi district mills are still conducting their return to the market with moderation so that thus far this increased available tonnage has not seriously affected the market. However, it is generally believed that another fortnight to three weeks will be necessary to give these mills a sufficient backlog to obviate the possibility of depression caused by their competition for business. In the meantime, many Belgian mills, with insufficient forward business on their books, are offering slight concessions. French producers are still well booked with business and offering only mild competition.

Pig Iron.—Unaffected by the depression in the steel market, pig iron prices continue quite firm and with most furnaces booked well into the next quarter there is a tendency to decline further tonnage at present. Demand continues heavy, but prices are unchanged. No. 3 phosphoric foundry with 2.50 to 3.00 per cent silicon holds at about $15.90 per metric ton, f.o.b. Antwerp, while Bessemer grade is about $20 per metric ton, f.o.b. Antwerp. Coke prices continue at about $5.55 per metric ton, f.o.b. oven.

Semi-Finished Material.—The deadlock between buyers and sellers because of the difference in price ideas is still unbroken. Considerable supplies of blooms, billets and slabs are reported available but buyers refuse to meet the prices except to fill immediate requirements. Billets are firmer than recently and have shown a distinct upward tendency but blooms are weaker. Thomas steel billets 2 to 3 in. are held at about £4 10s 6d, $22.20 per metric ton and 3 to 4 in. at about £4 9s, $21.80 per metric ton, f.o.b. Antwerp. Thomas steel blooms are about £4 1s, $19.85 per metric ton, f.o.b. Antwerp and slabs about £4 15s, $23.30 per metric ton.

Finished Material.—With mills slowly running out of tonnage and feeling the competition of the return of the Charleroi makers to the market, signs of weakness are appearing in practically all finished products. A few mills have been fortunate in booking more foreign business, particularly from the United States, but German sellers are quoting lower prices and taking much of the foreign trade, especially British orders, that for a time went in rather large volume to French makers. The downward movement of prices is well illustrated in the weakness that has developed in steel bars. Concessions are being offered on desirable tonnages and specifications, so that the former quotation of £5 6s 6d, f.o.b. Antwerp has been practically superseded by a price of £5 6s per ton as mills become more in need of tonnage. Even this quotation is reported by exporters to be about 1s per ton higher than the German export price. Beams are showing considerable weakness in the face of lower priced German competition so that £4 17s per metric ton, $23.75 is about the top of the market. Wire rods are holding fairly firm at about £5 15s per metric ton, f.o.b. Antwerp. Corrugated bars are quoted at £5 14s per metric ton, about $27.95, f.o.b. Antwerp.

Luxemburg Market Steady

Fair Volume of Export Business with Far East —Prices Hold But German Competition Is Keen

LUXEMBURG, Feb. 28.—Furnaces booked a satisfactory volume of business during January and February and as a result have been able to slightly increase their quotations. Return to production of the Charleroi district in Belgium had been anticipated with some concern by Luxemburg interests, a decrease in demand and sagging of prices being expected in many quarters. The slight effect that the return of this capacity has exercised is viewed with satisfaction in Luxemburg, but the return of German mills to competition in foreign markets is a matter of some concern.

Export prices of Luxemburg mills continue firm in most instances and improvement of foreign trade with China and better inquiry from India are reported. As a whole, however, February export business was less satisfactory than January. This was largely because of the increase of German competition, lower export prices coming from Hamburg and through British agents for German producers, than could be quoted, f.o.b. Antwerp by Belgium, Luxemburg or Lorraine works.

The pig iron market is steady under the recently concluded entente of French, Belgian and Luxemburg producers and demand is quite satisfactory. Semi-finished steel prices are rather unsettled, but in most instances Luxemburg works are able to hold to original quotations about 6d per ton higher than their competitors, being well booked on forward contracts. Billets are held at about £4 10s. ($21.87), blooms about £4 2s. ($19.92) and slabs about £4 15s. ($23.08) per metric ton, all f.o.b. Antwerp. Quotations of Luxemburg mills on finished steel products are at about the same level as their competitors in Lorraine and Belgium.

There were 37 furnaces in blast in Luxemburg at the end of February. The total output of pig iron in January was 203,673 metric tons, of which 199,754 tons was basic Bessemer. The total ingot production was 173,244 metric tons, of which 1148 tons was open-hearth and 171,244 tons was basic Bessemer.

The merger of the two large Luxemburg interests "Arbed," the Acieries Reunies Burbach Eisch Dudelange and the Societe Metallurgique des Terres Rouges has been concluded.

Italian Iron and Steel Industry Active

WASHINGTON, March 9.—Unofficial estimates place the production of pig iron in Italy at approximately 400,000 metric tons and that of steel ingots and castings at 1,500,000 tons during 1925, the iron and steel division of the Department of Commerce is informed by Commercial Attache MacLean, Rome.

Although the production of pig iron did not reach the maximum of 471,000 tons recorded for 1917, it shows a large increase over 1924, for which the total was only 267,000 tons. The production of steel was the largest on record, the figure for 1917, when the war-time activity was at its height, having been 1,331,641 tons, and for 1924, 1,300,000 tons.

BOOK REVIEWS

Industrial Furnaces. By W. Trinks. Vol. II. Pages 405, 6 by 9 in.; illustrations, 292. Published by John Wiley & Sons, Inc., New York. Price, $5.50.

On several points I must take issue with the author, in his preface. He mentions no names of manufacturers, thus lessening the value of the book for the reader, referring those who wish to purchase equipment to buyers' guides (which he names without giving their addresses.) He also states, page 26, that the United States Bureau of Mines will furnish addresses of coal-analyzing laboratories. Why not give them in the book? He claims, as a good point, that his book enables the student to read trade papers critically "between the lines," stating that "what the trade papers print is generally true, but they dare not print everything that is true!" (The exclamation point is mine.)

Tables I and II, on properties of 15 kinds of fuels, unfortunately do not agree in the arrangement of the components with the somewhat different data concerning coke-oven gas, for instance, page 9. This makes comparison difficult.

As the composition of water gas, whether made in one or two generators, varies by reason of the constantly falling temperature during the run, the water-gas values may be taken with considerable allowance. Figs. 1 to 10 inclusive give very valuable graphs of ideal flame temperatures of various fuels, with and without pre-heating.

A valuable hint is given concerning the practical impossibility of getting continuously perfect combustion with natural gas when mixed with either water gas or cold producer gas. The futility of installing high-class burners intended to maintain a neutral furnace atmosphere, if the heating values and the gas combustion change continually, is pointed out, page 16. The statement, page 19, that blast-furnace gas is valuable "for heating furnaces in combined blast furnace and steel work plants, only," is not always true, seeing that the writer has used the gas for driving internal combustion motors, and heating boilers and ovens, in the same plant.

In Table V one sees that chestnut anthracite is six times as dear at the mines as barley size; this should "give to think" along the line of utilizing the smallest size. Considering our vast deposits of lignite, this fuel, which eventually must play an important rôle in our industries, might have been given more space.

The essential requirements of a fuel burning equipment are well stated, page 34; followed by the reasons for the difficulty of their fulfillment. Page 56 we have a formula derived from the Carnot theorem, which is difficult to use practically, because the conversion factor varies with the distance of the gas from the edge of the stream; also is less for low injection pressures than for high, and increases inversely with the ratio of jet diameter to induction-pipe diameter. The series of illustrated descriptions of combustion devices is very full; but the advantages of sharp contracted nozzles might be stated.

Chapter III takes up control of the furnace (charge) temperature with regard to space and time, and points out that it is control of product temperature rather than of furnace temperature that is important. Temperature control of gaseous fuel, as for instance with the Venturi tube, receives considerable attention. An interesting topic is that of bright annealing of iron and steel, and of non-ferrous metals (page 219 *et seq.*)

Without labor-saving devices such as furnace chargers, bloom turners, etc., large industrial plants would be impossible. These are given a good chapter. Devices for comfort and convenience are not forgotten. In Chapter VI we have a critical consideration of fuels and furnace types; and in the final chapter, hints concerning the selection of fuels and furnaces to suit plant conditions. The book contains an excellent alphabetical index.

R. G.

Handbook of Practical Mechanics. Pages 251; illustrations and numerous tables. Published by the author, Charles H. Saunders, Ph. B., 31 Bay State Road, Boston. Price, $1.50.

In the third edition of this practical book for the shop and drafting room, the author states that errors of the previous editions, which have been called to his attention, have been corrected. He acknowledges his indebtedness to the Pratt & Whitney Co., Brown & Sharpe Mfg. Co. and also to a number of leading mechanics of the country for valued assistance and suggestions in making the book of practical value for the shop worker and draftsman. The book is filled with tables, rules and formulas designed to provide simple and quick methods for solving the problems which are constantly arising in mechanical work.

Metallurgy of Aluminum and Aluminum Alloys. By Robert J. Anderson. Published by H. C. Baird & Co., Inc. Pages, 913; 6¼ x 9¼ in.; 295 illustrations. Price, $10.

This book covers a somewhat broader field than might be supposed from its title, since it deals with most of the phases of the aluminum industry from the occurrence of aluminum ores to the application of finished aluminum products. Among the topics discussed are the following: A historical and general survey of the aluminum industry; the occurrence and mining of aluminum ores; the purification of the ore, preparation of other materials entering into the manufacture of aluminum; reduction to metallic aluminum; constitution, structure and properties of aluminum and aluminum alloys; various manufacturing processes, such as melting, sand casting, die casting, and permanent mold casting; mechanical working; production of secondary aluminum from scrap, etc., as well as many of the applications of aluminum and aluminum alloys. The book is thus the most comprehensive treatment of aluminum in print.

The book is made up largely of material culled from the examination of a vast amount of existing literature on aluminum. This literature was widely scattered and for the most part out of date and unauthoritative. The preparation of a book having the scope indicated is a tremendous undertaking, and it would be surprising if the result were not open to some criticism. The author has obviously done a great deal of work and has collected much of the best published information on the subject. On the other hand, a considerable portion of the subject matter is inaccurate as to the statement of facts. The expressions of opinions and appraisals of various branches of the industry are often excellent, but are sometimes conspicuously at fault. Some of the information regarding the facts of the aluminum industry which may be regarded as inaccurate would be of considerable value if presented merely as approximately correct for the purpose of giving a general idea of the subject under discussion, but is apt to be misleading when presented as exact.

The book as a whole is unnecessarily long. In addition to the task of collecting the large amount of subject matter involved, it is quite a problem to organize and present this material in the most brief and easily understood form. The book leaves something to be desired in this respect. There is a very good index, however, which compensates somewhat for these defects.

This book will undoubtedly be read by many who are interested in the aluminum industry. Those who are already well informed will find it interesting and in many respects useful, particularly on account of the bibliography and the abstracts, and will be able to exercise their own judgment in regard to the acceptance of the various statements of fact and opinion. Those who are less familiar with the subject will find the book the best existing source in a collected form of general

information on the many various phases of the aluminum industry, and a book which will be useful and valuable if read with the caution in mind that some of the material presented is inaccurate or obsolete.

R. S. ARCHER.

Heat Economy of Power Plants and Combustion Equipment in Industry, with Particular Reference to the Iron, Paper, and Chemical Industries. By Wilhelm Tafel, professor at the Polytechnicum in Breslau, Germany. Pages, 349; 5 x 9 in.; 125 illustrations, and two tables. Obtainable from G. E. Stechert & Co., 31 East Tenth Street, New York. Price, $3.

The never ending increase of technical applications of physics and chemistry leaves very little time for the teacher in engineering to discuss those fundamentals which are common to different lines of engineering. Professor Tafel, who teaches what might be called the mechanical engineering of the chemical industries, found himself in the before-mentioned position and decided to write a text which would show the application of heat and combustion engineering to the various branches of engineering, and more particularly to steel works engineering and chemical engineering. This text, which was recently published by R. Oldenbourg, München and Berlin, has the following contents:

The principles of thermodynamics as foundation of heat economy. Diesel engines and gas engines. Steam engines and steam turbines, including boilers, superheaters, and steam regenerators. Principles of combustion, including regeneration and recuperation of combustion air and the movement of gases in furnaces. Losses on combustion of fuels and efficiency of combustion. Construction and operation of various combustion devices and furnaces. There are two short chapters on heating of factories and on measurements in connection with combustion devices.

The third part of the book contains applications to special industries, more particularly to iron and steel. The heat economy of the blast furnace is discussed in detail, while the heat economy of the converter, of the open hearth, and of the electric furnace are given somewhat more briefly. The application of heat economy to the rolling mill and to the rolling mill furnace is investigated in some detail.

Those who can read German will enjoy the book, because it gives a birdseye view of heat economy in the various industries. Those who specialize in heat economy and in combustion engineering will perhaps find fault with the rather general treatment which Professor Tafel gives the subject, but the detailed treatment which the specialist is looking for can be given in a text book. The book is destined and intended particularly for students of chemical and metallurgical engineering, and does indeed fill the bill of giving them that fundamental knowledge of the application of heat which they need later on in their daily work, with the understanding that additional, and more detailed knowledge must be gained later on by actual experience or by reading of trade papers and scientific publications. W. T.

Metallurgical Analysis. By Nathaniel Wright Lord and Dana J. Demorest. Fifth edition. Pages 472, 5¼ x 8 in.; illustrations, 31. Published by the McGraw-Hill Book Co., New York. Price $4.

This valuable contribution to metallurgical literature (a number in the International Chemical Series), devotes 18 of the first 20 chapters to the ferrous materials; and the remaining 26 cover quite well the list of metals and other substances coming up in industry. For the purpose of refreshing the student's mind, the introduction states succinctly a number of fundamental laws of physics, as for instance Boyle's law for gases, Gibbs' phase rule, and the electrolytic solution tension theory (Helmholtz's "double layer theory.")

The first chapter takes up the selection and preparation of samples for analysis; and after treating of the analysis of limestones, which after all must be understood by the generality of metallurgists, gives a good insight into the determination of iron in ores, of phosphorus in ores, iron and steel, of silicon, manganese, sulphur, carbon, nickel, cobalt, vanadium, chromium, tungsten, molybdenum, titanium, copper and arsenic; aluminum, uranium, and of oxygen and nitrogen in steel. Next, spelter, tin, aluminum, copper and lead are considered; after which come bearing metals viewed from the strictly chemical standpoint.

The determination of other elements in ores and alloys follows, after which with Chapter XXXV a new line is entered upon: electrometric titration, especially in connection with the determination of iron, vanadium and chromium electrometrically. Coal and coke as such take up five chapters, followed by several on the analysis of fuel and flue gases of all kinds, and of mine air, by standard apparatus such as Orsats', Hempel's and Burrell's. Chapter XLII goes very thoroughly into the heating value of gas and the determination of its special constituents, after which a diversion is made to the chemical analysis of clays, silicate rocks and slags; followed by the determination of gold, silver and platinum in ores and alloys. The next topic taken up is water analysis; the book then closing, with the exception of tables of reference and a very good alphabetical index.

The bibliographical references, especially under the chapter on electrolytic titration, are full and valuable. The whole treatment is to aid the better class of students to do good work and plenty of it, by commencing right, as for instance by assuring themselves of the absolute purity of reagents and the equally absolute accuracy and suitability of apparatus.

It would be very difficult for any body of chemists, no matter how well up in the theory and practice of their profession, to produce a better book for the purpose; for not only is the information full and reliable, but it is presented in such a way as to make it assimilable at first reading, and convenient for reference in time of doubt. R. G.

Non-Technical Chats on Iron and Steel and Their Application to Modern Industry. By La Verne W. Spring, A. B. Pages 358, 5½ x 8 in.; illustrations and diagrams 294. Published by F. A. Stokes Co., New York. Price $3.

This book gives the non-technical reader a wide range of facts, without going into details that would interest only technicians, and which would perhaps make the work tiresome to "the man in the street." For all that, the range is long enough to satisfy even the most exacting; running from the early history of iron, and considering the raw materials, giving a description of the blast furnace, and its operation, and a general view of wrought and cast iron, malleable iron, cement and crucible steel, and Bessemer steels. It then takes up the so-called alloy steels, especially the high-speed series; next the various processes are handled in an interesting manner—rolling, wire-drawing, pipe and tube making, etc., while the transformations and structures of the various kinds of steel are treated in such a way as to give the non-technical reader or even the technician in non-ferrous lines sufficient general information on the subject. The equilibrium diagrams of the iron-carbon alloys are given in such a manner as to be comprehensible to whoever has read the book carefully from the beginning up to the point where these are taken up; so that not merely such unusual words as "austenite" and "sorbite" have a definite and familiar meaning and the materials can be visualized, but even "eutectic" and the like are no longer Greek to him who wishes to follow the alterations in structure and qualities resulting from temperature changes.

The author's task has been much more difficult than that of the specialist who writes for metallurgists; and he has discharged it with credit to himself and with satisfaction to the general reader.

The Carnegie Institute of Technology, Pittsburgh, has published, as bulletin 27, a pamphlet of 36 pages entitled "Progress Report of Metallurgical Advisory Board to the Carnegie Institute of Technology and the United States Bureau of Mines, January, 1923, to January, 1924." The pamphlet contains liberal descriptions

of the various laboratories and discusses the organization of the advisory boards, the fellowships and their results, ferrous metallurgy at the Pittsburgh station of the United States Bureau of Mines, and facilities for metallurgical research at the Pittsburgh experimental station. The authors are T. D. Lynch, chairman, and Edward Steidle, secretary. The foreword is contributed by Dorsey A. Lyon, acting director of the United States Bureau of Mines, and the preface by Thomas S. Baker, president of the Carnegie Institute of Technology.

A Graphic Table Combining Logarithms and Anti-Logarithms. By Adrien Lacroix and Charles L. Ragot. Pages 64, 6¾ x 9¾ in. New York, the Macmillan Co., 60 Fifth Avenue, 1925. Price, $1.40.

Designed to avoid necessity for interpolation, and at the same time to expedite the process of finding the logarithm of a number or the anti-logarithm of a logarithm, this book presents in a most unique manner a visual means of accomplishing these results. Each page carries 25 lines, with division marks above and below each line. Those above the line carry the numbers from 10,000 to 100,000, while those below the line show the respective logarithms of the corresponding numbers. It becomes easy to determine the logarithm of a number or the reverse by mere inspection, and, in all cases, this may be carried to five places.

For those desiring greater accuracy, it is possible to estimate a sixth place under either the number portion of the scale or the logarithm portion. This extends the usefulness of the table for work requiring this degree of accuracy. Supplementary tables in the rear, for more rapid work, cover four places from 1000 to 10,000 in the same manner, and with 20 lines per page in place of the 25 used in the main portion of the book.

Inasmuch as the table works both ways, and without the use of interpolation, either estimated or calculated, a considerably greater speed in use apparently is possible. The simplicity of reading from the two scales placed in close juxtaposition makes the graphic table exceedingly convenient. It is pointed out by the authors that this method also is more accurate than the usual numerical table, because of the fact that fractions sometimes accumulate in such manner as to make the numerical table inaccurate in the fifth place. As to compactness, it is estimated that the present 40-page graphic table would require 380 pages in the ordinary type of table for direct reading without interpolation. This represents, therefore, a saving of nearly 80 per cent in space.

An extension of graphics into the field of pure mathematics is certainly in line with the progress in graphic presentation of other data, and it appears likely that this form of table may have a good deal of popularity, once its advantages become known.

Automobile Industry Facts

In a 96-page booklet, the National Automobile Chamber of Commerce, 366 Madison Avenue, New York, has gathered a large volume of statistics, illustrated with diagrams, showing many of the ramifications of the automobile industry. Among other things it is shown that the total production from 1895 to 1924 inclusive, aggregated 23,910,547 cars. Registration at the end of 1924 is given as 17,591,981. Exports in 1900 to 1924 inclusive numbered 1,332,045. Imports are given over only a short period—1918 to 1924—numbering 3578 in those seven years. If we estimate that the total imports in the 20 years of active life of the industry amounted to 25,000 cars, then the balance of registration, exports and imports, against total production, leaves a shrinkage or loss aggregating 5,041,521 cars and trucks over the period of 20 years.

Trend of output is shown by one chart, which indicates that at the end of 1924 about 65 per cent of all cars being produced were closed cars, on the basis of considering only those makes of which the touring model retails for more than $400. Of all cars produced in 1924, closed cars represented 43 per cent, being 1,397,482 out of 3,243,285 passenger cars made during the year. Truck capacities are mostly of one ton and less, this grouping covering 318,114 vehicles of the 374,317 produced in 1924. Only 10 per cent of all the trucks were of two tons or higher.

Electrical Developments in 1925

Featuring the progress of the past year in its production of electrical machinery and other equipment, the General Electric Co. has put out a 64-page pamphlet reprinted from an article by John Liston in the January issue of the *General Electric Review*. This is thoroughly well illustrated and covers a wide variety of topics from the electric drive of 180,000 hp. on the United States airplane carriers Saratoga and Lexington to lighting fixtures for streets and highways. Arc welding, gas-electric buses, city and suburban railways, refrigeration, oil-electric locomotives, sub-stations, water-wheel generators, electric drive for steel mills and electric furnaces are among the items covered.

Railroad Operations in 1925

Revenue car loadings in 1925 are reported by the Bureau of Railway Economics, Washington, at 51,178,000, a new high record, displacing the 49,812,000 of 1923. Traffic in net ton-miles, however, is slightly below 1923, with 456 billions of ton-miles, compared with 457.6 billions. Passenger miles at 35.9 billions came lower than in recent years, showing the competition of motor buses. In 1920 this figure was 46.85 billions.

In a report of 32 pages much information is given on railroad operation in 1925 as compared with preceding years. There are both tables and charts, thus making it easy to grasp the significance of the figures. Particularly striking is a chart on car shortage, which shows 1925 with no month reaching 2000, whereas the average for the five preceding years shows no month below 20,000.

New Books Received

Grundbegriffe der Mechanischen Technologie der Metalle. By George Sachs. Pages 319, 6½ x 9½ in., illustrated. Published by Akademische Verlagsgesellschaft M. B. H., Markgrafenstrasse 4, Leipzig, Germany. Price, $3.60.

Chemistry of Engineering Materials. By Robert B. Leighou. Pages 538, 5¾ x 8¼ in., illustrated. Published by the McGraw-Hill Book Co., 370 Seventh Avenue, New York. Price, $4.

Shop and Office Forms. By Wallace Clark. Pages 139, 6 x 9¼ in., illustrated. Published by the McGraw-Hill Book Co., 370 Seventh Avenue, New York. Price, $2.50.

Geschichte der Eisendrahtindustrie. By O. H. Döhner. Pages 105, 8 x 11 in., illustrated. Published by Julius Springer, Linkstrasse 23-24, Berlin, W 9, Germany. Price, 12 marks.

Tests for Railway Material and Equipment. By Henry Knauer. Pages 257, 5 x 7¾ in., illustrated. Published by Simmons-Boardman Publishing Co., 30 Church Street, New York. Price, $3.

Mechanics of Machinery. Kinematics and Dynamics. By Robert C. H. Heck. Pages 550, 6¼ x 9¼ in., illustrated. Published by the McGraw-Hill Book Co., 370 Seventh Avenue, New York. Price, $5.

The Industrial Museum. By Charles R. Richards. Pages 117, 6¼ x 9¾ in., illustrated. Published by MacMillan Co., 60 Fifth Avenue, New York. Price, $3.

The Ruhr-Lorraine Industrial Problem. By Guy Greer. Pages 328, 5 x 7½ in., illustrated. Published by MacMillan Co., 60 Fifth Avenue, New York. Price $2.

The Bureau of Standards. Its History, Activity and Organization. By Gustavus A. Weber. Pages 299, 6 x 9 in. Published by the Johns Hopkins Press, Baltimore. Price $2.

Decisions of Courts Affecting Labor, 1923-1924. By Lindley D. Clark and Stanley J. Tracy. Pages 551, 6 x 9 in. Published by the United States Department of Labor, Bureau of Labor Statistics, Washington, D. C.

Coal Analyses. Bituminous Coal Fields of Pennsylvania. Pages 268, 6 x 9 in. Prepared by the United States Bureau of Mines.

Limestone of Pennyslvania. By Benjamin LeRoy Miller. Pages 368, 6 x 9 in., illustrated. Published by the Commonwealth of Pennslyvania, Department of Forests and Waters, Harrisburg.

Statistical Abstract of the United States, 1924. Pages 824, 6¼ x 9¼ in. Issued by the United States Department of Commerce, Bureau of Foreign and Domestic Commerce, Washington.

Budgeting to the Business Cycle. By Joseph H. Barber. Pages 115. 5¼ x 7¼ in., illustrated. Published by the Ronald Press Co., 15 East Twenty-sixth Street, New York. Price, $1.25.

Fuels and Their Combustion. By Robert T. Haslam and Robert P. Russell. Pages 808, 6 x 9¼ in., illustrated. Published by the McGraw-Hill Book Co., Inc., 370 Seventh Avenue, New York. Price, $7.50.

Mineral Resources of the United States, 1922. Part II Non-metals. Pages 804, 6 x 9¼ in., illustrated. Issued by the Department of the Interior, United States Geological Survey.

Physical Metallography. By E. Heyn, translated by Marcus A. Grossman. Pages 440, 6 x 9¼ in., illustrated. Published by John Wiley & Sons, Inc., 440 Madison Avenue, New York. Price $6.

Metallurgy and Its Influence on Modern Progress. By Robert A. Hadfield. Pages 388, 6½ x 10 in., illustrated. Published by Chapman & Hall, Ltd., 11 Henrietta Street, London, W. C. 2. Price 25s.

Journal of the Iron and Steel Institute. Vol. CXII, No. 2, 1925. Pages 577, 5½ x 8½ in., illustrated. Published at the offices of the Institute, 28 Victoria Street, London, S. W. 1.

NEW TRADE PUBLICATIONS

Refractories.—Chicago Fire Brick Co., Chicago. Folder describing a new product "Electric Furnace Brisket." It is a fire brick cement for banding brick into the furnace walls.

Ball Bearings.—Standard Steel & Bearings, Inc., Plainville, Conn. Pamphlet entitled "The Burden Bearers," describes the forging of "SRB" molybdenum steel balls.

Electric Steel Castings.—Chicago Steel Foundry Co., Chicago. Leaflet describes "Evansteel" electric furnace castings.

Bond Testers.—Roller-Smith Co., 233 Broadway, New York. Bulletin covering two new devices for proving electrical bonds in steel rail joints.

Testing Machines.—Herman A. Holz, 17 Madison Avenue, New York. Bulletin No. 34 on the important advantages of design and construction of the Amster tensile testing machines with some remarks in checking the calibration of testing machines over their entire range.

Drill Steel Sharpener.—Sullivan Machinery Co., 122 South Michigan Avenue, Chicago. Bulletin 72-I of four pages describes a hammer-type sharpener for drills, which is able to make ordinary hammer steel drill bits and shanks.

Scales.—Toledo Scale Co., Toledo, Ohio. A circular, "The Measurement of Materials," which describes some of the features of the company's products and advantages of their use.

Heat Treating Furnace.—Automatic & Electric Furnaces, Ltd., London, E. C. 1, England. New catalog describes the Wild-Barfield electromagnetic steel hardening furnace. It contains 24 pages and is fully illustrated. There is a list of European and other companies using the furnace.

Safety Switches.—Westinghouse Electric & Mfg. Co. Publication of 56 pages, covering industrial, motor starting and meter service switches.

Iron Ores.—Clement K. Quinn & Co., Duluth and Cleveland. Leaflet on silicious iron ores describing two grades of ore, Kruse, a soft ore, and the Empire, a hard ore, coming from mines bearing the same names in the Marquette range. Both grades are crushed in 2-in. sizes. Attention is called to the moisture content of the Kruse ore, 7.25 per cent, as an indication of its relative softness and to the high silica and relative high iron content of both grades.

Worm Gearing.—Cleveland Worm & Gear Co., 3258 East Eightieth Street, Cleveland. Bulletin 105, 16 pages. Describes and illustrates various applications of the company's worms and gears, one being a worm and gear drive for a mechanical gas producer, one a drive for a vertical gas scrubber and a third for driving a machine for manufacturing rubber tubing. Types of the company's worm gear reduction units are illustrated. Various tables are included.

Ammonia Compressors.—American Engineering Co., Philadelphia. Catalog of 20 pages describing the Juruick ammonia compressor for refrigeration purposes and illustrating numerous uses. The compressor is made in sizes from 2 to 25 tons and for both hand and automatic control. It is driven by belt, usually from electric motor.

Testing Machines and Equipment.—Richlé Brothers Testing Machine Co., 1424 North Ninth Street, Philadelphia. Loose-leaf catalog showing details of testing machines as designed for different characters of work. Dimensions are given both in American and metric measurements. Accessories such as center punches, specimen holders, extensometers, hardness testers, etc., are shown, as well as torsional, impact and transverse testing machines in considerable variety.

Lumber Carrier.—Ross Carrier Co., Benton Harbor, Mich. Four-page description of a carrier with power lift for handling considerable quantities of lumber and other analogous materials. This is made with gasoline power and can take a load, in the largest size, with cross section up to 60 x 66 in.

Fin Furnace.—Combustion Engineering Corporation, Broad Street, New York. Twenty-page catalog illustrating and describing a type of water-cooled furnace wall stated to eliminate heavy expense in maintenance and to provide increased boiler capacity. Tubes are vertical and have fins on each side of such extent that those of adjacent tubes meet between the tubes. Headers at top and bottom provide for circulation. In an oil-fired boiler the fin tubes are sloping, parallel with the regular boiler tubes.

Steam-Heating Boiler Tests.—Lebanon Boiler Works, Lebanon, Pa. Four-page folder describing tests conducted at the Pennsylvania State College on a low-pressure steam heating boiler burning both coal and oil. Tabulated results when burning coal showed efficiencies running as high as 81.6 per cent when operating at 173 per cent of rating. With oil the highest efficiency was 81.3 per cent on 161 per cent of rating. Under both headings the boiler was forced to much higher ratings, the coal reaching 214 per cent and the oil 234 per cent.

Air Compressors.—Sullivan Machinery Co., 122 South Michigan Avenue, Chicago. Bulletin 83-B of 16 pages, featuring belt-driven air compressors for atomizing fuel and for other purposes. Several types and sizes of the machine are shown. The line covered runs from 68 to 1472 cu. ft. displacement per min of free air. Pressures run from 15 to 120 lb. sq. in.

Phosphor-Bronze.—Phosphor-Bronze Smelting Co., Philadelphia. Booklet of 40 pages, containing prices. It is designated as Price List No. 29 of the "Elephant Brand" alloy.

Flow Meters.—Republic Flow Meters Co., Chicago. Pamphlet of 16 pages discusses the Republic water meters produced by the company. A list of the installations is included.

Drill Steel Furnace.—Sullivan Machinery Co., 122 South Michigan Avenue, Chicago. Bulletin 74-B of 12 pages features a furnace using either fuel oil or gas for safe, rapid and economical heating of drill steel. This furnace has a length of 4 ft. 9 in., width of 2 ft. 9 in. and a height of 4 ft. 2 in.

Standard Practice for Molding

(*Continued from page 755*)

green-sand runner. The dry-sand runner must be given a heavy coat of wet blacking, and placed in the oven with the mold.

In ramming the dry-sand runner box, rods must be laid across the bottom of the runner box with both ends of the rods resting upon the inside flanges of the runner box. This is necessary, to support the sand across the bottom of the runner. The same plan must be used in making the dry-sand riser heads. The dry-sand runner box and heads are used in place of green sand, to avoid the danger of dirt or loose sand getting into the mold.

The dry-sand riser heads and the dry-sand runner basin or pouring basin are shown in Fig. 8. The dry-sand pouring basin is shown also in Fig. 9.

27.—To avoid drop-outs and a great deal of trouble punching holes through the cope, the stem chaplets must be placed in the mold, in their proper position, while the cope is being rammed. They can be removed after the pattern is drawn, to make the button, or pulled out far enough to make this possible. Have the foreman give the location for the stem chaplets.

28.—When the mold is completely rammed as per instructions, secure the cope half of the pattern by forcing four wood screws through the sand into the pattern, and holding them with rods and wedges across the top of the flask before the cope is lifted off.

29.—Lift off the cope, roll it over, wet down the joint with a liberal supply of water and make parting. The parting must be a straight line from the pattern to the joint of the flask to avoid crushes, and a liberal clearance allowed. Dry-sand molds have no give and, if the joint fits too tightly, there will be a crush.

30.—Draw the patterns. Finish the surface of the mold until it is smooth and free from tool-marks. Clean out all the loose sand before applying the wet blacking. Apply the blacking thick, about ⅛ in.

31.—After the blacking has set long enough to become stiff enough to "slick," it must be finished smooth, with all corners brought out sharply, and gone over with a camel's hair brush and molasses water.

32.—Place the mold in the oven. In doing this, put the cope part of the mold on the car first, and the drag part on top of it, because the drag part of the mold is the hardest to dry, on account of being protected by the bottom plates. The drag part of the mold must be more dry than the cope part of any dry-sand mold, to insure a solid casting.

33.—When the mold is taken out of the oven, ascertain that it is dry enough to close and cast, by pushing a ½-in. round vent rod into one of the positive vents and allowing it to remain there 30 sec. If the rod is dry, when drawn out, the mold is dry enough to cast. If the rod is sweating, when drawn out, the mold is not safe to cast, and may cause soggy places in the heavier sections of the casting, while the outside surface may appear good. The mold must be returned to the oven for more drying.

34.—To close the mold for casting, place the drag part of the mold on the foundry floor with a support under each bottom plate. Be sure the mold is level.

35.—Try all the clamps that are holding the bottom plates to the flask and, if they are loose, tighten them.

36.—Brush and blow out the mold. Blow out the gate cores, repair any part of the mold that has been broken; also any defects in the gate cores.

37.—Place four 1-in. stem chaplets in the bottom of the mold, making sure that the end of the stem is resting on the bottom plate and the head end of the chaplet extending into the mold the distance that corresponds with the thickness of metal required at that point. The location of these chaplets in the mold must be the same as the location of the chaplet plate in the cores. Chaplet plates are shown in Fig. 8.

38.—Place six double-headed chaplets with ¾-in. stem in the drag part of the mold, to act as an additional support for main core No. 2.

39.—Pick up main core No. 2 with crane and lower it into the mold to its proper place. Fig. 10 shows the drag mold with core No. 2 in position.

40.—After the first main core has been placed in position and is resting upon the 1-in. stem chaplets and the six double-headed chaplets, check the metal at the bottom of the mold between the cores and the mold and at the sides of the mold next to the joint and the core. The metal must be the same at these three points. If this is not true, the main core must be removed and an adjustment made in the length of the chaplets, and the core replaced and checked until the metal is correct at all three points.

41.—When one main core is placed, the second one must be placed in the same manner.

42.—When No. 1 and No. 2 main cores have been placed in the drag, each main core must have located, up on the exposed side, no less than 12 clay balls, these to be placed at the point where a double-headed chaplet is to be used.

After the clay balls are in position, the cope part of the mold must be put into the drag. At this time be sure to have the same flask pins in the cope that were used when the mold was rammed, and see that they are tight and that there is no shift. No excuse will be accepted for not using standard flask pins, and having them screwed up tightly in the flasks. The shifting of molds, "Sun about," must not be allowed at any time. It is each foreman's duty to see that each man has the necessary flask pins at all times, and it is the molder's duty to stop work until he has them furnished him.

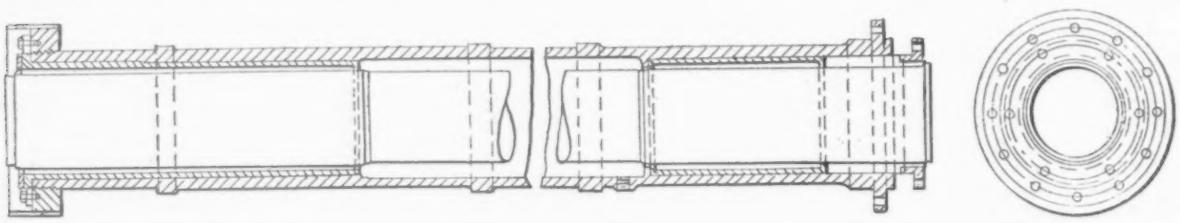

Fig. 12—Cross Section of Stern Tube as Completed and Assembled With Glands and Contained Length of Shafting. The tube as molded according to instructions in this article is the outside member, with its cross-hatching running "from northeast to southeast"

43.—When the cope part of the mold is placed on the drag, drive four steel clamps on each side of the flask, clamping the cope and the drag together. This is to make sure that there will be no crush when the cope is closed for the last time.

44.—Knock off the eight steel clamps, lift off the cope, and lower it onto a suitable horse or timbers without rolling it over, unless there is some patching necessary. Never hold the cope on the crane while getting ready to close. Such practice is expensive and should not be allowed.

45.—With the cope off, the 12 clay balls are found on the upper part of the main cores and the cope part of the mold has squeezed them down to the thickness of the mold cavity. The next operation is to place a double-headed chaplet, with the necessary shims under it to bring the flush with the top of the clay ball. This will insure the proper bearing of the cope on the chaplet and will hold the core in its position. This work must be done with every clay ball. Do not remove a clay ball until a double-headed chaplet has been provided to take its place. Do not at any time guess the length of these chaplets. They are of no value unless they fit correctly between the main cores and the cope. In placing the double-headed chaplets on the main cores, wire them together with light wire to prevent their sliding off the core.

46.—With the double-headed chaplets in position, the next thing is sealing the vents that have been provided to carry off the gas from the main cores.

Fig. 11 shows the mold closed, with the vent rods pushed through the holes in the end of the flask into the vents in the main core. The plan is to place all the vent rods in position and to ram green sand around them, thus sealing the vent passages, so that there is no danger of any metal getting into them.

47.—Before closing the cope for the last time, ram up the green sand vent seal around all the vents that are below the joint of the drag, blow out mold and place the condenser pieces. The condensers are small pieces of cast iron segments located near the flange of the stern tube, to prevent the usual shrink hole at that point. This is shown in Fig. 8. Do not close a stern tube mold without a condenser casting in place, except on special orders from the office.

48.—Now we have the mold blown out, the main core vents sealed up as far as the joint, all the double-headed chaplets in place, the condenser properly located, and we are ready to close the mold for the last time.

49.—Place a roll of dough 1 in. in diameter all around the joint, to prevent any run-out. This dough ball must extend over the ends of each main core, so there will be a tight joint between the print and the core, which will not allow any loose sand to work into the mold, when the vents are being rammed.

50.—After the mold is closed, clamp the cope and drag together with 16 steel clamps, 8 on each side. In clamping the mold, drive the first 8 on gently, then go on the other side and drive the next 8 on hard; return to the first eight and drive them on hard. This is important, and must be done in this manner at all times.

51.—Now that the mold is clamped, the next operation is to finish sealing the vents from the main cores located in the cope half of the mold. This must be done by ramming the sand around the vent rods through the opening in the top of the cope. These openings are at both ends of the main core prints. Fig. 11 shows the opening through the cope that is used for this purpose. After the vents are rammed, the vent rods are drawn out and a free passage is formed from the vents of the main core through the vent holes in the end of the flask. This plan must be followed at all times and no change made at any time. No vents may be left out.

52.—Place the anchor bars in position so that they will come directly over the end of the stem chaplets that extend through the cope. Clamp them to the upper flange of the cope flask, and wedge between the upper end of the stem chaplet and the lower surface of the chaplet bar. These wedges must be forced in snugly so that there will be no danger of their coming loose, as these wedges and stem chaplets and chaplet bars hold the main core in position and are subjected to immense pressure.

53.—Place a ring of dough ball around each down-gate and put the dry-sand runner into place. Do the same to the dry-sand riser heads.

54.—Fill the opening between the drag flange and the cope flange of the flask, at the joint, with facing sand and ram as hard as possible until the opening is filled flush with the outer edge of the flanges. This is done to prevent a run-out.

55.—Figs. 8 and 9 are cross-sections of the mold ready to pour.

The above standard practice, now being followed, has accomplished three things: It has produced a higher grade of castings; it has reduced the cost of molding 50 per cent, and it has made it possible for apprentice boys to do the work, too.

Freight Rate Discriminations

Donner Steel President Suggests Railroad Consolidations May Increase Difficulties of Adjustment

UNIONTOWN, PA., March 8.—Western Pennsylvania coal and coke operators, at a banquet at the White Swan Hotel on Saturday night, had the effects of the freight rate discriminations against the bituminous industry brought before them by speakers who presented facts and figures. It was the third annual banquet under the auspices of the Fayette Greene Coal Producers' Association. Ninety-two per cent of the bituminous coal production of western Pennsylvania was represented by the 322 diners. Messages were brought by United States Senator David A. Reed, of Pennsylvania; William H. Donner, president Donner Steel Co., Buffalo, and others.

During the war, said Mr. Donner, arbitrary advances in freight rates were made in order to produce revenue, without regard to the relative cost of transportation and irrespective of the many resulting discriminations between locations and between commodities. Operation of the railroads was of prime importance in the prosecution of the war. Those arbitrary and unscientific rates have not been corrected and it is now almost impossible to have them adjusted. The railroads, now in the hands of private owners, do not concern themselves, he continued, as to the fairness of rates or whether they discriminate against certain localities.

How Rates Differ

In 1901, he pointed out, the rate on iron ore from Lake Erie ports to Pittsburgh amounted to 99 cents and that on coal moving in the reverse direction 73 cents. "The rate today on ore is $1.10, while the comparative rate on coal is $1.66, an increase of 11 cents on iron ore and of 93 cents for coal. On coal for consumption at Lake Erie ports the rate is $1.84. The wide difference developed during the war."

Following other illustrations, including unequal rates for various Pittsburgh-seaboard movements, Mr. Donner touched on rates in Minnesota. "On June 25, 1918," he said, "the Government in order to produce revenue taxed all consumers of Lake ore by increasing the rate 36½c. per ton from the Mesabi Range to the Lake Superior ports. It did not, however, increase the rate on ore from lower Lake Erie ports to Pittsburgh or interior furnaces.

"Not so much care was taken to avoid doubly taxing the steel manufacturer removed from the coal fields. On June 25, 1918, the rate on Pittsburgh coal to Lake Erie ports was advanced approximately the same amount, or to be exact, 37c. To show you that this rate from the Mesabi Range to Lake Superior was purely in the nature of a tax, the D. M. & N. Railroad earned 117 per cent on its capital stock in 1917. Of that 36½c. per ton advance on ore from the Mesabi Range to Lake Superior, 27½c. per ton still remains in effect. This 27½c. is a tax to all consumers of Mesabi ore, excepting the United States Steel Corporation, owning the D. M. & N. Railroad, which transports about half of the Mesabi ore and earned last year slightly over 200 per cent on its capital stock.

Danger of Rail Consolidations

"The independent ore producers have gone to considerable expense to have this rate from the Mesabi Range reduced, but owing to the fact that the Great Northern Railroad, which hauls about half of this ore, has a system embracing more than 8000 miles and has not earned a fair return on its entire system, the Interstate Commerce Commission has refused to reduce this rate notwithstanding less than 5 per cent of the mileage of the Great Northern Railroad is devoted to the transportation of Mesabi ore.

"I believe you will all agree with me that no small branch should be allowed to charge an exorbitant rate on a commodity like ore because it is attached to a large railroad system that needs revenue. If this policy is to be continued I hope there will be no further consolidation of railroads, because on that basis it would pay any profitable railroad to absorb weak lines, so that it could earn a larger return on its entire system."

Mississippi Barge Shipments of 60,000 Tons of Steel in 1925

The Federal Barge Line of the Mississippi-Warrior Service handled a total of 58,977 tons of finished iron and steel products on the Mississippi River in the calendar year 1925.

Commodity	*Tons*
Tie plates	58
Track spikes	1,230
Angles, iron and steel	1,984
Bands, iron and steel	432
Bars, iron and steel	9,045
Beams, iron and steel	1,405
Channels, iron and steel	1,123
Pipe, iron and steel	11,073
Plates, iron and steel	4,747
Sheets, iron and steel	8,386
Structural steel	121
Tank material	8
Tin plate	1,893
Boiler tubes	439
Axles, car	189
Bolts and nuts	2,385
Buckles, cotton tie	25
Chain	606
Wire fencing	1,127
Galvanized iron	6,551
Nails	1,621
Pipe fittings	151
Rivets	175
Bale ties	324
Iron washers	523
Sash weights	27
Car wheels	588
Iron wire	2,736

Trade Changes

The Holland Furnace Co., Holland, Mich., has opened two sales offices in Seattle and will erect a large warehouse in that city for the better distribution of its house-heating furnaces. Frank M. Horejs and J. A. Pas have been made sales managers of the two branches, one of which is at 1019 Eighth Avenue.

The Metal Products Mfg. Co. has been organized at Seattle, to manufacture wood and metal products.

The name of the Sumner K. Prescott Co., Seattle, has been changed to the Prescott Iron Works. The company manufactures saw mill machinery and lumber trucks and does a general foundry business.

Maxted & Knott, Ltd., consulting engineers, 23 Queen Anne's Gate, Westminster, S. W. 1., London, England, has been reorganized following retirement of F. Knott, one of the founders of the firm, after 34 years of continuous activity in the company. Mr. Knott retains a financial interest, and will continue to take an advisory part in its affairs. E. G. Walker, Westminster, has joined the firm on the retirement of Mr. Knott. Mr. Walker, who has cooperated with the firm on various occasions during the past seven years in connection with some of the works which the firm has carried out both in this country and abroad, has been in practice as a civil engineer, specializing mainly in structural work, in steel and reinforced concrete, and in the heavier classes of engineering construction. His practice has been incorporated with that of the firm.

H. F. Allen Co., Inc., machinery dealer, 30 Church Street, New York, is moving to room 372 at 50 Church Street.

The Minneapolis Steel & Machinery Co., Minneapolis, has reorganized its administration department and elected W. C. MacFarlane president. The annual report shows that the company did a gross business of more than $6,000,000 in 1925.

Henry Disston & Sons, Inc., Philadelphia, has opened a new service branch and warehouse at Detroit. Stock will be carried of Disston electro-crucible high-speed steel, carbon tool steels and special alloy steels, made in the Disston steel works at the Tacony factory. Band saws and circular saws for wood and metal, hack saws, files, and machine knives will also be stocked in the new branch.

The Harnischfeger Corporation, Milwaukee, manufacturer of gasoline excavators and trenching machines, has appointed the Clark-Wilcox Co., 17 Lafayette Street, New Haven, Conn., and also at 786 Albany Street, Boston, in place of the K. B. Noble Co., Hartford, Conn. The Harnischfeger Corporation has appointed the William H. Hale Co. as agent in Minnesota, with headquarters at 607 Fifth Avenue, South, Minneapolis.

The Leary & Manley Co., Spring Grove and Alabama Streets, Cincinnati, has been incorporated under the name of the Queen City Foundry Co., and will continue the production of gray iron castings under that name. Additions contemplated include a cleaning room and equipment. J. D. Leary is president.

Battey & Kipp, Inc., engineer, specializing in industrial plants, West Madison Street, Chicago, is moving April 1 to 231 S. La Salle Street.

The Central Steel Co., Massillon, Ohio, has opened a district sales office at 404 West First Street, Tulsa, Okla., in charge of L. S. Allen, who besides connections with Eastern mills has had contracts with the oil drilling industry.

Tate, Jones & Co., Inc., Leetsdale, Pa., has terminated the sales arrangement it had with the General Furnace Co., Philadelphia, and hereafter will market its own products under the direction of E. J. Cobner, general manager of sales.

The Cisco Machine Tool Co., Cincinnati, has purchased the patents, patterns and manufacturing rights of the Mueller Machine Tool Co., Cincinnati, and will add the Mueller radial drill to its line of Cisco lathes. Manufacture of the Mueller lathe will be discontinued, but the Cisco Machine Tool Co. will service those lathes now in use.

A branch office has been opened by the Industrial Works, manufacturer of steam shovels, cranes, etc., at 455 Monadnock Building, San Francisco. Harvey L. Livingston, formerly with Norman B. Livermore Co., San Francisco, has been appointed manager of sales by the Industrial Works in the California and Arizona territory.

The Manley Sand Co., 527 West Roosevelt Road, Chicago, has been organized recently to represent in Chicago the Rockton Molding Sand Co., Rockton, Ill. L. T. Manley is in charge of the office.

The Era Steel Co., Bucyrus, Ohio, has been incorporated and on March 1 took over the operation of the steel foundry and the sales of manganese and alloy steel products of the Hadfield-Penfield Steel Co. of that city. The latter company has announced that the increasing demand for its manganese steel and other alloy steel products made it advisable to operate the steel foundry department as a separate unit.

The Chicago Pneumatic Tool Co. has acquired the George Oldham & Sons Co., Baltimore, effective Feb. 16. The manufacture of the Oldham products which are continued will be conducted at the Detroit plant of the Tool company, at 6201 Second Boulevard. The sales will be combined and handled from the Tool company's branches in the principal cities, as well as through domestic and foreign agency connections. The Oldham products requiring repairs should be sent to branch located nearest the customer, or forwarded to Detroit.

The St. Louis office of the St. Louis Coke & Iron Corporation has been removed to 933 Planters Building. The office had been located in suite 428 of the same building.

General offices of the Columbia Steel Co. have been opened in the Standard Life Building, Pittsburgh. This is a new company representing a merger of the Columbia Steel Co., Elyria, Ohio, and the Forged Steel Wheel Co., Butler, Pa., completed early this year after negotiations of several months. Frank B. Foster, Oliver Building, Pittsburgh, was the intermediary in the deal.

The Rockford Milling Machine Co., Rockford, Ill., has appointed the Cleveland Duplex Machinery Co., Cleveland, as exclusive dealer in that territory for Rockford millers and Sundstrand lathes. The Rockford company has appointed the Seifreat-Elstad Machinery Co., Dayton, Columbus and Cincinnati, to represent exclusively the Sundstrand lathes in those districts.

Archer & Baldwin, Inc., dealer in used machinery, Bound Brook, N. J., hereafter will be located at 126 Liberty Street, New York.

At the annual meeting of the Koppers Co., Pittsburgh, all officers and directors were reelected. The following changes were made in some of the subsidiary companies: In the Koppers Construction Co. H. B. Rust becomes chairman of the board; W. F. Rust, president; C. J. Ramsburg, Joseph Becker, Harold Doolittle, Halfdan Lee and J. I. Thompson, vice-presidents. T. G. Janney, manager of the Chicago By-Product Coke Co., was elected vice-president and manager. D. MacArthur, manager of the Seaboard By-Product Coke Co., was elected vice-president. J. T. Tierney was appointed manager of the Seaboard By-Product Coke Co. E. L. Smith, manager of the Minnesota By-Product Coke Co., was elected vice-president and manager. F. H. Beebe, manager of the Western Gas Construction Co., was elected vice-president and manager. J. P. Williams, manager of the Melcroft Coal Co., was elected vice-president and manager. J. N. Forker, formerly purchasing agent of the Koppers Co., was elected vice-president and manager of the American Tar Products Co. D. M. Craig was appointed assistant to president, Koppers Co. F. W. Sperr, Jr., was elected director of research, Koppers Co. W. L. Williams was appointed purchasing agent, Koppers Co.

Cuyahoga Steel & Wire Co., Bedford, Ohio, manufacturer of cold-drawn carbon and alloy steel bars, wire for cold heading work, welding rods and special shapes, has established a district sales office for Ohio, Indiana and western Pennsylvania at 1655 Union Trust Building, Cleveland. The office will be under the management of John T. Au Werter as district sales representative. For many years Mr. Au Werter represented, in his territory, the Peerless Drawn Steel Co., Massillon, Ohio.

Climax Engineering Co., Clinton, Iowa, has appointed several new dealers for the sale of Climax engines. H. Y. Smith Co., 1301 First National Bank Building, Milwaukee, will handle Milwaukee and Eastern Wisconsin. A. K. Miller Engineering Co., 112 North Water Street, Mobile, Ala., is the new agent for southern Alabama; while L. H. Staley, 515 Whitney Building, New Orleans, is the new dealer in Louisiana.

The Petroleum Heat & Power Co. has moved from 1775 Broadway to 511 Fifth Avenue, New York. The company handles oil-burning equipment and fuel oil.

The National Engineering Co., 549 West Washington Street, Chicago, manufacturer of sand mixers, has made several changes in its officers. H. S. Simpson is president; T. S. Hammons, first vice-president; S. T. Johnston, second vice-president and T. Kauffman is secretary and treasurer. A. G. J. Rapp is supervisor of the engineering department.

The Cleveland office of THE IRON AGE has been moved from the Guardian Building to room 1362 Hanna Building.

Lee & Clark, Inc., 549 Washington Boulevard, Chicago, has been incorporated to take over the business formerly conducted as a partnership under the name of the James T. Lee Co. James T. Lee is president and John O. Clark is vice-president. The company specializes in hydraulic equipment, plate-working tools, metal-working machinery,

pumps, car-wheel borers, pipe benders and flexible steam joints. Mr. Lee was formerly vice-president Hanna Engineering Works, Chicago, and for the past five years was Western manager of the Southwark Foundry & Machine Co., Philadelphia. Mr. Clark was, for a number of years, sales manager of the Hanna Engineering Works.

The Nugent Steel Castings Co., 3100 South Wood Street, Chicago, is now under the direction of W. G. Frye, C. R. Messinger, both of Milwaukee, and W. J. Nugent, the three having purchased the interest of Charles Piez, president Link Belt Co., and Prentiss Coonley of the Walworth Co. The Nugent company was organized ten years ago as the Electric Steel Co. and the name was changed later. The present board of directors is composed of W. J. Nugent, W. G. Frye, C. R. Messinger, C. F. Messinger, J. M. Olmstead and C. A. MacDonald. Officers are: W. J. Nugent, president; Harold C. Osman, secretary, and C. A. MacDonald, treasurer. Papers are being filed for the organization of a Delaware corporation.

The Smith Brothers Hardware Co. has moved into the new building at 580 North Fourth Street, Columbus, Ohio. The main building, six stories and basement, 150 x 220 ft., of brick and steel construction, contains appointments for efficient handling of heavy and light hardware, automobile accessories, mining supplies and sporting goods. There is a warehouse for steel stock and a receiving platform of five freight car capacity, also trucking platforms and garage. D. E. Mooney is president and R. Schrader, secretary.

Industrial Finance

American Steel Foundries, in the 1925 annual report, shows gross sales of $42,795,095, compared with $46,088,069 in 1924. Net profits were $4,669,737, or approximately $7.30 per ton of output. Current assets were $21,386,256, against current liabilities of $3,117,832. Working capital is given as $18,247,856 and surplus $11,641,313. Total assets are listed at $54,448,605, of which $30,892,522 represents the depreciated value of plant equipment, etc.

Annual report for 1925 of the Chicago Railway Equipment Co. shows current assets of $3,775,008, compared with current liabilities of $150,420. Total assets are given as $6,198,247, of which the plant accounts for $3,233,221, less practically 50 per cent thereof as depreciation reserve. Profits at end of year were $1,249,607, of which $389,583 went as dividends.

Annual report for 1925 of the American Locomotive Co. shows a deficit for the year of $843,321. Gross earnings amounted to $27,773,493 and manufacturing profit was $468,948. The deficit was produced by the depreciation item of $1,312,269. Assets and liabilities are shown as $73,967,983, compared with $87,729,615 in the preceding year. The heavy reduction came from a sharp cut in several of the items of current assets, which are reported for 1925 at $30,616,161 against $44,466,404 in 1924. This has resulted in a reduction of the total surplus from $27,989,707 to $16,396,385. Lack of orders for locomotives gave the company the lowest output of any year since its formation in 1901.

The National Acme Co., Cleveland, reports an operating profit of $957,473 for 1925 and net profit of $573,402, as compared with a loss in 1924. Sales showed an increase of 35 per cent over the previous year. There was an increase of 15 per cent in the products department and 70 per cent in machinery sales. Machinery business for export increased $600,000 over the previous year. A. W. Henn, the president, in his annual report predicted that the domestic machine business will hold up well because the current wave of trade expansion has not yet reached its crest, because of the tendency to replace more promptly obsolete and worn machinery, and because of the tendency to install automatic machinery to offset the diminishing amount of skilled labor. The retrenchment policy was adhered to during the year and the proceeds of the sale of various assets were used for retiring bonds. The bonded debt has been reduced from $5,000,000 to $3,500,000.

Net earnings of the Bucyrus Co., Milwaukee, as a result of the increased demand for excavating machinery, shows a substantial increase for 1925 as compared with 1924. The annual report recently issued gives the net profits for 1925 as $1,620,629, after depreciation and taxes, compared with $1,489,459 in the preceding year. Earnings on the $4,000,000 common stock after preferred dividends in 1925 equaled 33.51 per cent, against 30.24 per cent in 1924.

Stockholders and directors of the Moloch Co., Kaukauna, Wis., manufacturer of automatic stoking systems, power hammers, paper and pulp mill equipment, have agreed upon a general plan of reorganization which is expected to result in quick relief from the stringency of working capital that has hampered the operation for several years. The Moloch Co. is a consolidation of the Kaukauna Machine Works and the Moloch Stoker Co. of Chicago, which was effected Sept. 13, 1920. The reorganization plan embraces a total issue of $375,000 of stock, of which $200,000 will be common, to be set aside for present shareholders, and $175,000 preferred, to be sold as new stock. The reorganized corporation will be governed by a board of nine directors. Newly elected officers and directors are: President, C. Raught; vice-president, J. M. Brown; general manager, R. M. Kanik; secretary, H. Weifenbach; directors, L. F. Nelson, F. A. Towsley, H. S. Cook and C. Jacobson.

Annual report for 1925 of the Motor Wheel Corporation, Lansing, Mich., shows gross sales amounting to $26,233,969, compared with $20,984,106 in 1924, in spite of a reduction in unit prices. The number of sets of wheels produced in 1925 was 38 per cent greater than in 1924. The company retired all of its bonds during the year, the amount having been $1,568,500. Purchases in the open market of $661,800 of preferred stock raised the amount of that stock in the sinking fund to $841,800. In addition, $650,000 of preferred stock has been retired and cancelled, leaving the present outstanding amount at $1,008,200. Net profits for the year were $2,882,394. After payment of preferred dividends this amounts to $5.02 per share on the 550,000 shares of common stock outstanding, compared with $3.76 in 1924 and $2.56 in 1923. Net amount added to surplus after common dividends were paid was $1,679,353, bringing the total surplus to $5,778,918. The payroll during the year aggregated $4,387,889, for a total of 2839 employees.

Annual report for 1925 of the Timken Roller Bearing Co., Canton, Ohio, shows manufacturing profit of $12,466,984, compared with $9,616,655 in 1924. After deducting selling expenses, depreciation, taxes, etc., the net profit becomes $8,088,338, compared with $5,805,686. Dividends of $4,803,528 resulted in a surplus of $3,284,810, which, added to the accumulated profit and loss surplus makes a total of $19,064,780. The net profits in 1925 represented $6.73 on each of the 1,200,882 outstanding shares of no par capital stock, compared with $4.83 in 1924.

Annual report for 1925 of the Chrysler Corporation shows total income of $29,291,560 and net income after Federal taxes of $17,126,135. After paying preferred dividends of $1,750,460, the remaining surplus was $15,375,735. This was equivalent to $5.67 per share on the 2,711,640 shares of no par common stock. An initial quarterly dividend of 75c. per share, to be paid April 2 on the common stock, was declared. Total assets amounted to $85,602,497.

The Brown Hoisting Machinery Co., Cleveland, has sold through the Cleveland Trust Co. a bond issue of $1,250,000 in 6 per cent first-mortgage gold bonds. The company's annual earnings after depreciation, from 1906 to 1925, are given at $468,187.

Annual report for 1925 of the United States Cast Iron Pipe & Foundry Co., Burlington, N. J., shows net profit for the year of $5,501,265. Out of this, dividends were paid on preferred stock to the amount of $1,441,371, the remainder being added to the surplus account, which stands now at $15,161,678. Total assets and liabilities aggregate $42,205,903, of which current assets are $16,417,467 and current liabilities $2,371,225. Property and plant, less depreciation, are listed at $25,715,419. This represents an increase during the year of $2,045,465, while $2,250,903 was spent for repairs to buildings and unkeep of machinery, equipment and tools.

Annual report for 1925 of the American Telephone & Telegraph Co. shows net earnings of $129,036,334. After paying interest and $9 per share dividends on capital stock, there was a balance of $26,360,620. Of this amount $6,000,000 was carried to reserve for contingencies. Assets and liabilities are shown in the balance sheet at $1,645,565,374, of which current assets amounted to $84,947,503. Total surplus is given at $159,149,564.

Gross operating revenue of the Citizens Gas Co., Indianapolis, manufacturer of by-product coke, was $6,359,380 in 1925. Operating expenses totaled $4,953,602, leaving a gross operating income of $1,405,778. The company's net income was $826,402. Dividends on preferred stock were $70,000; on common stock, $200,000; back dividends on common stock totaled $260,000, leaving $296,402. After deducting $56,227 charges against the surplus, a balance of $240,175 was left to carry to the surplus account. During the year the company bought and retired $389,000 general mortgage 7 per cent bonds. Coke sales in 1925 increased 20 per cent over the previous year, coal tar and water gas sales 40 per cent and ammonia sales 35 per cent.

The Utah Steel Corporation, Salt Lake City, filed a petition, through James J. Burke, receiver for the company, in the Third District Court asking permission to sell the assets of the corporation. This corporation was placed in receivership 3½ years ago on suit of the Utah Oil Refining Co. The receiver earned a profit for the company of $75,463 the first year, $47,753 during the second year and in the third year, $10,900, it is reported. The falling off is attributed, by the receiver, to the natural handicap and restriction of receivership, coupled with keen competition.

Central Steel Co. Report

The Central Steel Co., Massillon, Ohio, in its annual report for 1925 shows gross earnings of $5,563,119 as compared with $4,966,637 during the previous year. The net earnings were $3,374,095 as compared with $2,899,823 during 1924. After the deduction of dividends $1,899,864 was transferred to the profit and loss account. Sales during 1925 were $36,674,613, a gain of $5,996,757 over the previous year. During 1925 the company increased its plant and equipment account $523,610 and charged off $720,000 for depreciation, bringing its total reserve to $5,574,948; increased its reserve for employees' insurance $100,000; absorbed in operating costs repairs amounting to $1,245,980 and increased its surplus $1,859,670. Manufacturing costs were decreased during the year, although the average yearly wage of employees was $149.85 greater than during 1924. F. J. Griffiths, chairman of the board, states in a report:

"The automobile trade during the last year has been reducing prices, which was reflected in the price of alloy steel, making our market more competitive, but we have been able to cut overhead, systematize production and reduce the labor cost per ton, so that we have practically absorbed this differential and our earnings have been maintained." Referring to the outlok for the alloy steel industry Mr. Griffiths states in the report:

"The trend of the times is to use alloy steel instead of carbon steels and thereby lessen weight and increase efficiency. We can emphasize our statement of last year that, within ten years, practically every industry using steel will be forced through competition to exploit alloy steel in its products. If our prediction is true, and we have every reason to believe that it is, alloy steel is but in its infancy and it shall be the aim of our company to grow with the growth of the industry." The company expects to have its new blast furnace in operation by June 1.

Report of Rima Steel Corporation

Considerable shrinkage in output appears to have occurred in the plants of the Rima Steel Corporation of Hungary, according to the annual report of the company for 1925. Steel ingots and castings in the business year 1924-25 were produced to the extent of 113,564 metric tons, compared with 185,499 tons in the preceding year. The decline in production of pig iron was from 149,165 tons to 63,744 tons. Iron ore produced dropped from 178,656 to 68,355 tons. Nearly all of the ore was roasted in the later year, compared with about two-thirds of the total in the earlier year.

It will be remembered that about a year ago this company floated a $3,000,000 loan in the United States. The balance sheet, expressed in kronen, shows that loan (214,-200,000,000 kronen) amounting to 63 per cent of the total liabilities (339,000,000,000 kronen) of the company. The profit and loss surplus for 1924-25 was about 12,700,000,000 kronen, or more than twenty times the accumulated surplus from previous years.

Niles-Bement-Pond Co. Shows Loss

The Niles-Bement-Pond Co., 111 Broadway, New York, manufacturer of machine tools, reports a loss of $799,519 for 1925 after depreciation, compared with a loss in 1924 of $1,185,808. The profit and loss surplus of the company is now $3,547,315. In his statement to stockholders, James K. Cullen, president, refers to the sale of the Bement Works in Philadelphia, and the Bement foundry at Nicetown, Pa., and the Pond Works at Plainfield, N. J., followed by the concentration of manufacturing activities at Hamilton, Ohio. Mr. Cullen reported that sales during 1925 were somewhat less than in 1924, and that so far as can be judged at present there will be little change in the volume of business placed during the first half of this year.

Power Machinery, Inc., 278 Newark Avenue, Jersey City, N. J., has been incorporated to deal in second-hand power plant equipment, such as air compressors, boilers and engines, motors and generators, switchboards, etc.

The Middletown Mfg. Co., formerly of Middletown, Ohio, has moved to Trenton, Ohio, to be nearer the foundry which is supplying the bulk of its castings. The company manufactures gas-fired water heaters. H. D. Martindale is president.

The White Motor Truck Co., Cleveland, has purchased property at Washington and Maple Avenues, Los Angeles, upon which it will erect a large service plant, costing about $500,000. Tentative plans are under way for a building which will house the sales and accounting headquarters for the entire Southwest.

Industrial News Notes

Henry Disston & Sons, Inc., Philadelphia, manufacturer of saws and other tools, has added a machine knife manufacturing department to its branch factory in Cincinnati. This factory will serve users of Disston machine knives in the Middle West and parts of the South. Hardening and tempering equipment and machinery for grinding and beveling high-speed planer knives of all sizes have been installed in the Cincinnati plant. The steel for these knives will be supplied from the Philadelphia plant.

David H. Smith & Sons, Inc., iron and steel jobber, is building an extension to its present warehouse at the foot of Fifty-first Street, Brooklyn, to be used exclusively for storing reinforcing steel. Structural steel for this building is being rolled and fabricated by the Bethlehem Steel Co.

The Koehring Corporation, Milwaukee, during the past week shipped 16 carloads of concrete mixers, paving outfits and gasoline shovels to Miami and Tampa, Fla. During 1925 the Koehring company's business in Florida amounted to one-seventh of its total output, shipments during the past year numbering 91 carloads. It is employing 900 men on a 10-hr. schedule in its foundries and machine shop, the largest number in its history.

The Ajax Electrothermic Corporation, Trenton, N. J., has purchased a 25-acre tract of land near Trenton, upon which a plant and office building will be established. The plot has considerable frontage along the Reading Railroad. Plans call for the erection of a factory 60 x 200 ft., together with a two-story office with 4000 sq. ft. of floor. Buildings and equipment are estimated at about $80,000. It is expected that the company will be in its new quarters in April. Structures are being erected by E. W. Easby, Inc., Philadelphia. The company manufactures high-frequency induction electric furnaces on the design of Dr. E. F. Northrup, vice-president. G. H. Clamer is president.

The Union Malleable Mfg. Co., Ashland, Ohio, recently organized to manufacture malleable pipe fittings, has the following officers: A. G. Katz, president; L. H. Katz, vice-president; S. Jacobson, secretary and sales manager; J. Jacobson, treasurer. The plant, now in full operation, is supervised by J. P. Arndt, and the galvanizing department is in charge of W. A. Bryson, formerly with the Hanlon Gregory Galvanizing Co. The plant has modern equipment for uniform threading and chamfering operations.

To meet special needs of the Allis-Chalmers Mfg. Co. and the Falk Corporation, Milwaukee, for equipment to ship heavy machinery and castings, the Chicago, Milwaukee & St. Paul Railway receivers have ordered four new cars of special design to be delivered July 1. Two cars will be of the depressed bottom steel frame type, and two of the Wells flat style. The depressed type will provide for a 9-in. clearance above the rail, 16 ft. 2 in. long, compared with a 22-in. clearance now the lowest in use. They are designed to accommodate large units without disassembling, and provide ample clearance through tunnels, under bridges, etc. Each car will cost $7,500. A schedule of 18 days for the round trip from Milwaukee to Seattle and return is planned. The cars will return to Milwaukee empty.

The L. H. Gilmer Co., Philadelphia, manufacturer of feed ribbons, fan belts and other woven products, announces the purchase of a new factory at Wayne, Mich., a suburb of Detroit. The new plant consists of a two-story brick building with 50,000 sq. ft. of floor space located on a 4½-acre tract on the main line of the Michigan Central Railroad, with ample sidings, and two blocks from the Pere Marquette passenger and freight station.

The Lapham-Hickey Co., 1625 West Pershing Road, Chicago, has been organized with Edward B. Lapham, president; Frank E. Hickey, vice-president and treasurer, and Robert P. Lapham, secretary. It will be exclusive representative for the Fitzsimmons Steel & Iron Co., Chicago, and will carry a complete stock of the Weirton Steel Co.'s cold-rolled strip steel. Commodities featured by the new company will be cold-finished bars, cold-rolled strips, cold-rolled and cold-drawn magnetic iron, drill rods, music wire, cold-rolled shim steel, tempered spring steel, annealed spring steel and electrical sheets.

Stockholders of the Anchor Drawn Steel Co. at the annual meeting, Feb. 15, reelected as directors D. R. Wilson, G. W. Morrison, W. W. Noble, H. V. Blaxter, J. E. Barnett, R. C. Stiefel and K. W. Daly. The directors subsequently organized as follows: D. R. Wilson, president; G. W. Morrison, vice-president; W. W. Noble, vice-president and secretary; Charles Potter, treasurer and assistant secretary. The company has an office in the Farmers Bank Building, Pittsburgh, and works at Latrobe, Pa. It is engaged in the manufacture of both high-speed and carbon steel drill rods and of the finer grades of cold-drawn specialties.

Machinery Markets and News of the Works

BUYING LESS ACTIVE

Machine Tool Business So Far This Month Shows a Decline

Inquiry Continues Fairly Good in Some Sections, Though of Lesser Volume in Others

REPORTS from machine tool buying centers agree that business has shown a decline in the past week or two. In some sections the volume of inquiry keeps up, but orders are fewer in number and many prospective buyers, the railroads in particular, are slow to take action on their known requirements. The Cincinnati district has a more favorable report than other districts, sales there having shown a slight gain over the preceding week. A Cincinnati company has booked orders for a total of 26 lathes from two automobile companies. Among the pending inquiries there is one for 60 polishing machines.

Railroad buying is quiet, but a few orders have been placed by the Pennsylvania, Missouri Pacific and the Baltimore & Ohio. In the main, however, the lack of interest in new tools on the part of the railroads is a source of disappointment to the machine tool trade. The Santa Fe and New York Central have sent out inquiries for a few tools.

Machine tool builders are generally gaging production to meet the demand. Some plants are fairly busy, but most of the standard tools can be shipped in four to six weeks. In certain cases deliveries extend over a longer period.

New York

NEW YORK, March 16.

MACHINE tool business continues moderately good, although some sales offices report a falling off in orders within the past two weeks. The volume of inquiries is large, pointing to the possibility that the halt in buying, if such it really is, may be only temporary. Eastern machine tool companies are receiving a better volume of business from the Central West than from the Atlantic seaboard. The Central of Georgia and the Pennsylvania railroads have been placing some orders; among the machines the latter road has bought is a combination journal turning and axle lathe. The Singer Mfg. Co., Elizabeth, N. J., bought 12 5-in. and 6 10-in. Pratt & Whitney automatic milling machines. The Moore Drop Forging Co., Springfield, Mass., bought eight additional automatic millers, a purchase of four having been reported last week.

The Freed-Eisemann Radio Corporation, Manhattan Bridge Plaza, Brooklyn, has begun the removal of its plant to a new six-story and basement factory at Liberty Avenue and Junius Street, East New York section of Brooklyn, where large increase in capacity will be arranged; considerable new equipment will be installed.

The Albert Pipe Supply Co., Inc., Berry and Thirteenth Streets, Brooklyn, has been inquiring for a pipe machine to handle 18-in. diameter stock and larger, motor-driven.

Motors and other power equipment, conveying and elevating machinery will be installed in the four-story printing plant, 145 x 340 ft., to be erected by the New York *Evening Journal*, 238 William Street, to cost $800,000. Contract for building has been let to the Turner Construction Co. Charles E. Birge, 29 West Thirty-fourth Street, is architect.

Pisciotta Brothers, Inc., 426 Troutman Street, Brooklyn, manufacturer of plumbing specialties, plumbers' wood work, etc., is having plans drawn for a four-story plant, 50 x 200 ft., to cost $125,000 with equipment. Laspia & Samenfield, 269 Broadway, Brooklyn, are architects.

The Grand Central Packard Renting Corporation, 45 Vanderbilt Avenue, New York, operating Packard automobiles for rental, has acquired a two-story building, 75 x 200 ft., at 340 East Forty-eight Street, for a service, repair and garage building. James P. Carey is head.

The Grand Corrugated Paper Co., 138 Thirty-second Street, Brooklyn, is asking bids on general contract for a two-story addition, 37 x 100 ft., to cost $35,000. Levy & Berger, 375 Fulton Street, are architects.

Officials of Jones-McKee, Inc., 170 Broadway, New York, valves, fittings, etc., have formed a new company of the same name, capitalized at $400,000, to take over and consolidate the present organization and the North American Supply Corporation, same address, steel and iron products. Expansion plans are under consideration. Bertrand Weiss is an official of the new organization.

The United States Cast Iron Pipe & Foundry Co., 71 Broadway, New York, with main plant at East Burlington, N. J., is said to be considering preliminary plans for a foundry at Chattanooga, Tenn., where 35 acres recently was acquired. It is expected to have initial buildings completed and ready for service in 12 to 18 months.

Bids have been asked by the Kotten Machine Works, 59 Academy Street, Jersey City, N. J., manufacturer of tools, etc., for its proposed two-story plant, 80 x 100 ft., at 166-170 Thirty-fourth Street, Brooklyn, to cost $30,000. H. J. Nurick, 44 Court Street, Brooklyn, is architect.

The Westinghouse Electric & Mfg. Co., 150 Broadway, New York, with main plant at East Pittsburgh, has leased space in the Bush Terminal, South Brooklyn, for a new Eastern storage and distributing branch.

The Hudson Brass Co., New York, has leased a floor in the building at 18 East Fourteenth Street, for the manufacture of electric lighting fixtures and kindred specialties.

Bids are being asked by the Board of Water Commissioners, Roslyn, N. Y., until March 20, for one motor-driven, single acting triplex plunger pump, capacity of 850 gal. per min., with accessories. Sidney B. Bowne, Mineola, L. I., is engineer. John Remsen is president.

The New York University, University Heights, New York, E. E. Brown, chancellor, has awarded a general contract to John Lowry, Inc., 270 Madison Avenue, for a two-story school of aeronautics on 180th Street, near Andrew Avenue, with mechanical department for engine and other work. It will cost $125,000 with equipment. Crow, Lewis & Wick, 200 Fifth Avenue, New York, are architects.

The American Sugar Refining Co., 117 Wall Street, New York, has authorized extensions and improvements in its refineries to cost approximately $7,000,000. Current expansion includes new buildings and machinery at the refinery in Brooklyn, and extensions in power house, fuel equipment, etc., at the refinery of the Franklin Sugar Refining Co., Philadelphia, a subsidiary.

The Lidgerwood Mfg. Co., 96 Liberty Street, New York, manufacturer of hoisting engines and equipment, has acquired 20 acres on Linden Avenue, Bayway, Elizabeth, N. J., as site for a new foundry and machine shop. Facilities will be provided for the employment of close to 1000 operatives. The company has disposed of its Brooklyn plant at Ferris and Dickman Streets, and will remove certain machinery to the new location. It is understood that the Newark plant of the company on Frelinghuysen Avenue, will be continued in service.

Fire, March 5, damaged a portion of the building and equipment of the Carteret Foundry Co., 32-72 Pacific Avenue, Jersey City, N. J. An official estimate of loss has not been announced.

H. M. Fischer, 460 Bloomfield Avenue, Montclair, N. J., architect, is preparing plans for a three-story addition, 50 x 100 ft., to the automobile service, repair and garage building at 250 Glen Ridge Avenue, including improvements in present structure, to cost $50,000.

The plant of the United States Hammered Piston Ring Co., 1206 South Grove Street, Irvington, N. J., has been acquired by the Thermo Electrical Instrument Co., which has been occupying the premises under lease. The plant is on site 100 x 150 ft., and totals 10,000 sq. ft. of floor space, all of which will be used by the purchasing company for expansion in manufacture. Dr. Thomas B. Freas is president.

Fire, March 5, destroyed a portion of the plant of the Miner-Edgar Alcohol Products Co., foot of Blanchard Street, Newark, industrial alcohol specialties, with loss reported at $100,000 including equipment. Plans for rebuilding are under consideration.

The Rapid Addressing Machine Co., 46 West Twenty-third Street, New York, is said to have tentative plans under consideration for a new one-story factory at Roselle, N. J., to cost about $50,000. T. D. Adams is president.

The Union Switch & Signal Co., Swissvale, Pa., is arranging for the immediate discontinuance of operations at the plant of the Hall Switch & Signal Co., Garwood, N. J., which was acquired as a subsidiary last September. Operations will be transferred to the Swissvale works where expansion will be arranged. The Hall plant has been giving employment to about 400 men.

The Madden Foundry, Millville, N. J., operated by John Madden, manufacturer of iron castings, is considering rebuilding the portion of its plant destroyed by fire March 6, with loss estimated at $35,000 including equipment.

Cecil H. MacMahon, receiver for the Gilligan-Barrett-Cahill Co., 398 Adams Street, Newark, contractor, is asking bids for the two plants of the company until March 24, consisting of a works on South Street, with tools, pumping equipment, steam shovel, asphalt plant, etc.; and a similar plant at Oak Tree, near Plainfield, N. J., with machinery.

The Rushmore Laboratory, Ravine Road, Plainfield, N. J., is in the market for a quantity of soft iron castings for gear pumps used in the steam cooling system of Ford automobiles. These castings weigh about 3 lb. each. It is also anxious to contract for the manufacture of gear pumps on a quantity production basis, this operation calling for grinding and drilling operations.

The General Foundry Products Corporation, Coxsackie, N. Y., has been organized by interests affiliated with the Coxsackie Holding Corporation and will operate a general jobbing foundry and machine shop. The company has obtained an option from J. G. Newbury to acquire a part of his foundry plant, including machine shop, at Coxsackie.

A cold rolling mill, 8 or 10-in. diameter rolls, is wanted by the Gilby Wire Co., Newark, N. J.

Philadelphia

PHILADELPHIA, March 15.

THE General Electric Co., Witherspoon Building, Philadelphia, will take bids at once for a proposed six-story and basement addition to its plant at Sixty-eighth Street and Elmwood Avenue, to cost close to $500,000 with machinery. Harris & Richards, Drexel Building, Philadelphia, are architects.

The Ajax Metal Co., 46 Richmond Street, Philadelphia, has taken out a permit to make extensions and improvements in its steam power house on Allen Street.

The Reading Co. (Philadelphia & Reading Railroad), Reading Terminal Building, Philadelphia, will make extensions and improvements in its repair shops at Reading, Pa., to cost about $4,000,000. It also has tentative plans for the electrification of its suburban lines at Chestnut Hill, Glenside and Trevose.

A. C. Gruenewald, 855 North Fourth Street, Philadelphia, will build a one-story ice-manufacturing plant on Walnut Lane, to cost $30,000.

Charles Peterman, 2857 North Palethrop Street, Philadelphia, president Advance Machine & Foundry Co., recently organized, is arranging for early superstructure work for a one-story foundry and machine shop at Glassboro, N. J., to cost about $75,000 with machinery.

The Baltimore & Ohio Railroad Co., B. & O. Building, Baltimore, has preliminary plans for a ten-story cold storage produce terminal and refrigerating plant at Philadelphia, to cost approximately $10,000,000 with equipment. H. L. Kimball is company architect. The Reading Co., Philadelphia, is interested in the project.

The Huck-Gerhardt Co., Inc., 1030 North Bodine Street, Philadelphia, manufacturer of millwork products, sash, doors, etc., has awarded a general contract to Schaefer & Co., 1600 Arch Street, for a new plant to cost $40,000. Clarence E. Wunder, 1520 Locust Street, is architect.

The Keystone Drawn Steel Co., Spring City, Pa., recently organized with a capital of $300,000, will establish a local plant for the manufacture of special steel products; a fabricating works will be installed. Isaac D. Hetzell, 322 Richmond Street, Philadelphia, is one of the officials of the company.

The American Chain Co., Inc., Bridgeport, Conn., is planning for the removal of a number of departments to the branch works at York, Pa., which will be arranged to accommodate an increase of about 100 men. The other branches of the Bridgeport plant will be continued. W. L. Brown is general manager at York.

Shapiro & Levy, care of A. M. Popper, secretary, Easton Board of Trade, Easton, Pa., recently organized to manufacture prepared roofing products, has leased property from the Lehigh Valley Railroad as a site for a proposed plant. The initial installation will include a stone-crushing plant; the mill equipment will include pulverizing and mixing machinery.

The Bearings Co. of America, Inc., recently formed under Delaware laws, will take over the company of the same name, organized under New Jersey laws, with plant at Lancaster, Pa. It will continue the manufacture of angular contact ball bearings, thrust ball bearings and kindred products. To carry out expansion and other features of operation, the new company is disposing of a stock issue of $1,750,000. Frank M. Germane, formerly connected with the Gilliam Mfg. Co., manufacturer of rollers bearings, and the Timken Roller Bearing Co., is president. J. L. Straub will continue as vice-president and general manager in charge of operations.

The Shippers Car Line, Inc., 165 Broadway, New York, a subsidiary of the American Car & Foundry Co., same address, has acquired the plant and business of the American Welding Co., Carbondale, Pa. The new owner will continue operations and has preliminary plans for expansion in output. The present management will be retained.

The Metropolitan Edison Co., Reading, Pa., has arranged for the sale of a bond issue of $3,500,000, a portion of the fund to be used for extensions and improvements in power plants and system. E. L. West is president.

The Downingtown Paper Co., Downingtown, Pa., has plans under way for a new mill for the manufacture of paperboard products. A bond issue of $750,000 is being sold to carry out the project. J. Gibson McIlvain is president.

The Brown-Booth Laboratories, Inc., 233 North Sixty-third Street, Philadelphia, has been incorporated to manufacture radio receiving sets and magnetic receivers. The company will have the parts manufactured on contract and will assemble in its own shop. It is in the market for radio electrical apparatus, diaphragm steels, die-castings, permanent magnets, coils, horns, and other similar materials used in the construction of magnetic radios.

New England

BOSTON, March 15.

AN unexpected lull has appeared in the local machine tool market, and reports from other sections of New England indicate a slowing up in business. A contraction in new prospects is also noted and some firms on the point of purchasing equipment have put off buying indefinitely. The falling off in sales apparently has hit houses dealing in both used and new equipment harder than representatives of tool builders, who still continue to book orders, although not on as large a scale.

Bids have closed for a one-story, 24 x 80 ft. fire alarm signal station on Washington and Thayer Streets, Brookline, Mass., for which miscellaneous mechanical equipment will be needed. Little & Russell, 20 Newbury Street, Boston, are the architects.

The Russell Mfg. Co., Middletown, Conn., has awarded contract for the erection of a 36 x 124 ft. factory for the treatment of asbestos. Firing and mixing machinery will be used.

W. P. Hatch, 60 State Street, Boston, has prepared plans for a three-story, 60 x 125 ft. manufacturing plant to cost $100,000 at Everett, Mass., for the Metropolitan Lithographing & Publishing Co., Dane Street, that city.

Fire recently damaged to the extent of $50,000 one of the units and the cupola of the Plainville Casting Co., Plainville, Conn. It is planned to rebuild the burned portion at an early date. Henry T. Washburn is general superintendent.

The Screw Products Corporation of America, capitalized

The Crane Market

THE volume of new inquiry for cranes is small but a fair amount of business is reported to have been placed in the past week. The Phoenix Utility Co., 71 Broadway, New York, which closed on a small hand power crane this week has a 7½-ton hand power crane for Sanford, Fla., still pending. Recent purchases reported to have been made by the General Electric Co., Schenectady, N. Y., are understood to include an order for a 30-ton and 20-ton cranes for Lynn, Mass., duplicate of a purchase last fall. In addition to several cranes for export the General Electric Co. is taking bids on a 20-ton hand power crane for Schenectady. The Baldwin Locomotive Works, Philadelphia, has closed on four more crane trolleys for Eddystone, Pa.

Among recent purchases are:

Anaconda Copper Mining Co., 25 Broad Street, New York, a 10-ton, 100-ft. span, 5-motor gantry crane for use in Arizona from the Whiting Corporation.

Delaware, Lackawanna & Western Railroad, New York, a 15-ton, 3-motor pillar crane for Black Rock yards, Buffalo, N. Y., from the Whiting Corporation.

Phoenix Utility Co., 71 Broadway, New York, a 5-ton, low headroom hand power crane for Fort Lauderdale, Fla., from the American Crane Co., Friendship, N. Y., and a 5-ton, 18-ft. span hand power crane for Trinidad, Tex., from the Reading Chain & Block Corporation.

Baldwin Locomotive Works, Philadelphia, for the Eddystone plant, four 25-ton trolleys from the Niles-Bement-Pond Co. and four 20-ton, 47-ft. span, 3-motor used Milwaukee overhead cranes from Joseph Greenspon's Sons Iron & Steel Co., St. Louis.

J. & J. Rogers Co., Au Sable Forks, N. Y., a 10-ton, 31-ft. span hand power crane from the New Jersey Foundry & Machine Co.

West Virginia Pulp & Paper Co., New York, a 10-ton, double trolley, 62-ft. 10-in. span hand power crane for Covington, Va., from the Armington Engineering Co.

Gulf States Creosoting Co., Savannah, Ga., a 20-ton locomotive crane from the American Hoist & Derrick Co.

Public Service Gas & Electric Co., Newark, N. J., a 10-ton gasoline operated crawl-tread locomotive crane from the Industrial Works.

B. Katchen, iron works, Newark, N. J., a 3-ton, 30-ft. span hand power crane with electric hoist from the New Jersey Foundry & Machine Co.

Winnsboro Granite Co., Winnsboro, S. C., a 20-ton used Brownhoist locomotive crane with a 2-cu. yd. clamshell bucket from Philip T. King, New York.

Leavitt & Hardy, Inc., Staunton, Va., a 20-ton used Browning locomotive crane with 1-cu. yd. clamshell bucket from Philip T. King, New York.

New England Power & Construction Co., Worcester, Mass., a 25-ton locomotive crane from the American Hoist & Derrick Co.

Georgia Creosoting Co., Brunswick, Ga., a 20-ton locomotive crane from the American Hoist & Derrick Co.

for $2,500,000, will establish a plant in Taunton, Mass. It is proposed to equip a building for an initial production of 10,000 gross lag and wood screws per day. Approximately 450 threading and 24 heading machines will be required. Bion C. Pierce is president and William Hughes, Taunton, treasurer.

The Royal Typewriter Co., New Park Avenue, Hartford, Conn., has awarded a general contract to the Denis O'Brien Sons Co., 118 Asylum Street, for a one-story addition, 48 x 106 ft. Headquarters are at 316 Broadway, New York.

The Liberty Tool & Garage Works, Woonsocket, R. I., has awarded a general contract to the C. I Bigney Construction Co., 184 Washington Street, Providence, R. I., for a one-story machine shop, 80 x 120 ft., on Toronto Avenue, Providence.

The Board of Education, Bristol, Conn., has arranged a list of machinery to be installed in the high school in connection with a vocational course. An appropriation has been granted.

The Green Mountain Power Co., Inc., Montpelier, Vt., operated by the Montpelier & Barre Light & Power Co., organized to develop and operate power properties of the last noted, is completing plans for the construction of a hydroelectric power station at Molly's Falls, Marshfield, Vt., with initial capacity of 7000 hp. A transmission line will be built from the power site to Montpelier, about 16 miles. To provide funds for the project, a bond issue of $750,000 is being sold. D. E. Manson is president.

The City Council, Salem, Mass., is considering the construction of a municipal automobile service, repair and garage building, to cost $150,000 with equipment. The city engineer is in charge.

The Aetna Automatic Oil Burner Co., Inc., Manucentre, Providence, R. I., has awarded a general contract to the C. I. Bigney Construction Co., 184 Washington Street, for a one-story addition to cost $20,000.

The Connecticut Light & Power Co., Waterbury, Conn., is disposing of a preferred stock issue of $5,500,000, of which about $2,250,000 will be used for extensions and improvements in power plants and system.

The City Council, Quincy, Mass., is considering the installation of pumping equipment in connection with proposed extensions and improvements in the municipal water works to cost $600,000. An appropriation has been authorized.

The Millers Falls Co., Millers Falls, Mass., manufacturer of augurs, bits, and kindred wood tools, has acquired the plant and business of the Accurate Tool Co., Detroit, manufacturer of aluminum and wood spirit levels, etc., and will consolidate. It is proposed to continue operations at Detroit for 60 to 90 days to complete present orders, following which machinery will be removed to the Millers Falls plant where a new unit will be established for the additional line of production.

Chicago

CHICAGO, March 15.

THIS market is quiet, and dealers find that sales so far in March are smaller than in the latter part of February. Inquiry is fairly active for practically all types of machine tools, but users are slow to sign contracts. Railroad buying is light and fresh inquiries are limited to several tools added to the Santa Fe list and two 16-in. lathes and several drilling machines asked for by the New York Central. The delivery situation remains as during the previous week and no price changes are reported.

The Panama Canal Purchasing Department will open bids in Washington on an 18-in. selective head motor-driven lathe; a 27-in. selective head motor-driven lathe; a 32-in. Cincinnati, or equivalent, constant speed motor-driven shaper; two portable heavy-duty motor-driven drills; a floor type sensitive drill; a 3-ft. radial drill; a belt-driven internal and external portable grinder, and a motor-driven pedestal grinder, with two 10-in. x 2-in. wheels.

The Edward Valve & Mfg. Co., East Chicago, Ind., has bought a 28-in. shaper and a No. 6 vertical die sinking machine. The Allis-Chalmers Mfg. Co., Milwaukee, has purchased a 42-in. planer, and the Raymond Brothers Impact Pulverizer Co., Chicago, has closed for a 16-in. open side Liberty planer on which delivery will be made in June. The Illinois Steel Co. has bought a 72-in. x 37-ft. heavy-duty engine lathe. The Missouri Pacific bought a 1500-lb. steam hammer and the Nash Motors Co. a 6-spindle drill-type milling machine.

The Chicago Mfg. Co., 1462 South Michigan Avenue, Chicago, will build a one-story sheet metal shop, 100 x 121 ft., to cost $36,000. S. E. Strobel, 110 South Dearborn Street, is the architect.

Charles R. Canfield, 6232 South Bishop Street, Chicago, will erect a machine shop, 77 x 125 ft., at 6796 South Chicago Avenue, to cost $20,000. R. C. Clark, 7218 Harvard Avenue, is architect.

The Trinidad Electric Transmission, Railway and Gas Co., Trinidad, Colo., has preliminary plans under way for a new steam operated electric power house, estimated to cost $200,000 with equipment. W. P. Southard is general manager.

The C. F. Haglin & Sons Co., Lumber Exchange Building, Minneapolis, has the general contract for the two-story steel and concrete factory, 60 x 100 ft., being built at Hopkins, Minn., for the Minneapolis Threshing Machine Co., at a cost of $100,000.

The Hallet & Carey Co., Minneapolis, has awarded a general contract to the McKenzie-Hague Co., 1502 Nicollet Avenue, for a grain elevator, including 16 steel and concrete tanks, to cost $300,000.

Contract has been let by the Frederick Post Co., 316

South Wabash Avenue, Chicago, manufacturer of blue print cabinets and kindred engineering products, to the Austin Co., for a one-story top addition, 65 x 190 ft., to cost about $25,000 exclusive of equipment. Frederick Post is president.

The Crane Co., 836 South Michigan Avenue, Chicago, has awarded a general contract to the Adams Co., 209 South La Salle Street, for its three-story addition, 120 x 475 ft. Graham, Anderson, Probst & White, 80 East Jackson Boulevard, are architects.

Power equipment, conveying and other machinery, will be installed in the new mill to be erected by the Quaker Oats Co., 80 East Jackson Boulevard, Chicago, at Cedar Rapids, Iowa, estimated to cost $4,000,000. A power plant will also be constructed. General contract has been let to the Leonard Construction Co., 37 South Wabash Avenue, Chicago, which is also the architect and engineer. John Stuart is president.

The Chicago, Burlington & Quincy Railroad Co., 547 West Jackson Boulevard, Chicago, is reported to be considering the construction of a new engine house with repair facilities at Burwell, Neb.

The Schlitter Iron Foundry, 3920 Wynkoop Street, Denver, Colo., has plans for a one-story addition, 35 x 60 ft.

The Jordan Machine Tool Co., 1854 East Twenty-eighth Street, Minneapolis, Minn., will ask bids in about 60 to 90 days for a one-story and basement addition, 70 x 110 ft., for which plans are being completed by C. J. Bard, National Building, architect. L. E. Jordan is president.

Following the completion of a two-story and basement office and operating building, now under way, the Electrical Engineers' Equipment Co., Mid-City Trust & Savings Bank Building, Chicago, plans the construction of a one-story manufacturing unit, 270 x 280 ft., on adjoining site at Twenty-fifth and Division Streets, where 17 acres recently was acquired. The entire project will cost about $175,000, with equipment.

The Minnesota Mining & Mfg. Co., Seventh and Fauquier Streets, St. Paul, Minn., manufacturer of abrasive materials and equipment, has taken bids for a branch plant at Detroit, estimated to cost $60,000. Toltz, King & Day, Builders' Exchange Building, St. Paul, are architects.

The Board of Education, Eureka, Ill., is considering the installation of manual training equipment in its proposed two-story high school to cost $160,000, for which plans are being drawn by Royer, Danly & Smith, Flat Iron Building, Urbana, Ill., architects.

The Minnesota & Ontario Paper Co., International Falls, Minn., has begun the construction of a new mill, to cost in excess of $100,000 with equipment.

Pittsburgh

PITTSBURGH, March 15.

WHILE March has shown some improvement over the quiet business of February, it is running behind the January record. There is a fair number of single tool sales, but in view of the large amount of plant betterment in progress, the general opinion is that business should be better. The character of the buying is much as it has been over the past few years, with single purpose tools, or special adaptations of standard tools the most active.

Tentative plans are being considered by the Star Ornamental Iron & Wire Co., 2319 Forbes Street, Pittsburgh, for a one-story addition, 80 x 100 ft.

An expansion program is being arranged by the National Radiator Co., New Castle Pa., for increased production at its local works. Initial improvements will include a yard crane runway, new charging floor for cupola, coke trestle, etc., to be followed by other work later. Headquarters are at Johnstown, Pa.

The Columbia Steel Co., Elyria, Ohio, and Standard Life Building, Pittsburgh, has engaged Barton R. Shover, Oliver Building, consulting engineer, to prepare plans for improvements in the strip mill of the Forged Steel Wheel Co., Butler, Pa., recently consolidaed, estimated to cost $75,000. Additional equipment will be installed. K. R. Jensen is vice-president and secretary.

The Blue Ridge Coal Corporation, Brush Creek, W. Va., has begun the construction of two new tipples at its mines Nos. 1 and 3, in Boone County, reported to cost about $150,000 with machinery. J. J. Ross is president.

The City Council, Liberty, Pa., plans the installation of a steel standpipe and other equipment in connection with extensions and improvements in the municipal waterworks, estimated to cost $45,000. Hudson & Myron, Wabash Building, Pittsburgh, are consulting engineers.

The Goodman Mfg. Co., Farmers' Bank Building, Pittsburgh, manufacturer of mining machinery, parts, etc, will make extensions and improvements in the factory recently acquired at Preble Avenue and Liverpool Street for a branch plant, estimated to cost $16,000.

The Standard Sanitary Mfg. Co., Besemer Building, Pittsburgh, will begin work in about 60 days on additions to its branch plant at Richmond, Cal., where seven acres has recently been acquired. The expansion will cost close to $1,000,000 with machinery. The company will also make enlargements in its enameled iron tub works in the northern section of Richmond, including additional equipment installation.

The Interstate Glass Co., Weston, W. Va., is contemplating extensions and improvements at its local plant to double approximately the present capacity. The work will include new gas producer equipment, tanks, etc. The company specializes in the production of sheet glass products. Headquarters are at Bradford, Pa. H. J. Walter is president and general manager.

The Pittsburgh Coal Co., Oliver Building, Pittsburgh, has preliminary plans under advisement for the complete modernization of its coal-mining properties in the Pittsburgh district, including the installation of electric power equipment, mining machinery, tipple equipment, etc. W. G. Warden is chairman of the board.

Cincinnati

CINCINNATI, March 15.

WHILE machine tool sales increased slightly the past week, the volume of new inquiries was the smallest of the year. Demand from the automotive industry is pronounced, a local builder having booked 26 lathes from two companies in that field. Automobile makers are expected to be steady buyers during the next two months, but business from that source is likely to be considerably less than in the last quarter of 1925. The Pennsylvania, Missouri Pacific and the Baltimore & Ohio have bought a few machines. Local builders, however, are disappointed with the lack of interest shown by most carriers. The general industrial field is yielding a sizable proportion of the orders placed with Cincinnati machine tool manufacturers. Action upon an inquiry for 60 polishing machines, on which quotations were made the past week, will probably be taken within the next ten days.

Production in local plants varies considerably. Several large builders are exceedingly busy and at least one cannot make deliveries on a certain type of machine in less than five months. Such conditions, however, are the exception rather than the rule. Most manufacturers are in position to supply tools in four to six weeks. Plant operations are being maintained at a moderate rate, but all builders are gaging production to conform to demand. For this reason few builders have many machines in stock.

The Cincinnati Planer Co. sold a 36-in. open-side planer in New England territory and a 7-ft. boring mill in Pennsylvania. The Baltimore & Ohio bought two 32-in. shapers. An automobile company in the Detroit territory took three automatic chucking machines from a local builder. The Armstrong Cork Co., Lancaster, Pa., and the Clark Brothers Co., Olean, N. Y., each purchased a 36-44 side-head boring mill from the Niles-Bement-Pond Co. The latter also booked a 2-in. x 37-ft. heavy engine lathe for the Illinois Steel Co., Chicago, and a 1500-lb. single frame steam hammer for the Missouri Pacific Railroad at North Little Rock, Ark. The John Steptoe Co. sold a 16-in. shaper in Milwaukee and a small milling machine in Los Angeles. A St. Louis company purchased a 32-in. x 22-ft. lathe locally, while a Buffalo firm bought a small gap lathe. Orders from automobile manufacturers are still the most important factor in the business of milling machine and grinder builders. A local turret lathe company reports that sales this month have been good and prospects are favorable for a continuation of present conditions.

The Pennsylvania Railroad bought a combination journal turning and axle lathe and the Sorocabana Railway Co., Brazil, purchased a 69-in. driving wheel lathe. The New York Central placed an order for a 32-in. radial drill. The Owen Bucket Co., Cleveland, took an 8-ft. x ¾-in. bending roll, while the Pratt & Whitney Aircraft Corporation, Hartford, Conn., is the buyer of a 36-44 sidehead boring mill. The Kermath Mfg. Co., Detroit, purchased a 3-ft. Morris radial drill. The McClintic-Marshall Co., Chicago, bought several Long & Allstatter punching machines in addition to those mentioned last week.

In the used machinery market the Detroit Body Die Co., Detroit, purchased a 36-in. x 12-ft. Niles planer and the Paper & Textile Machinery Co., Sandusky, Ohio, a 30-in. x 67-ft. Pond lathe. The Bury Compressor Co., Erie, Pa., took a horizontal boring mill, while the Foundry Service Corporation, Freeport, L. I., bought a 26-in. Pond lathe.

The Cincinnati Mfg. Co., 1900 Gest Street, Cincinnati, manufacturer of architectural iron and bronze products, has awarded a general contract to the H. C. Hazen Co., Reading Road, for a five-story addition, 60 x 75 ft., with one-story extension, 25 x 30 ft., to cost about $100,000 with equipment. Bert Baldwin, Second National Bank, is architect. A. H. Shoenberger is president.

The City Council, Hamilton, Ohio, has authorized plans for a proposed municipal electric light and power house, estimated to cost $527,000, for which funds are available. Walter Willard is city engineer, in charge.

The Shearman Concrete Pipe Co., Inc., Knoxville, Tenn., recently reorganized, has plans for two new works at St. Augustine, Fla., and Montgomery, Ala., respectively, each estimated to cost approximately $50,000 with equipment. George B. Newbold and Fred L. Connor are heads.

The Illinois Central Railroad Co., Chicago, has awarded a general contract to the Joseph E. Nelson & Son Co., 35 South Dearborn Street, for a one-story machine shop and boiler erecting works, 165 x 625 ft., at its shops at Paducah, Ky. Three large traveling cranes will be installed. The same contractor will also build a one-story steel tank and plate shop, 100 x 625 ft. Awards for other shop buildings at this location have been let to the Ellington-Miller Co., 417 South Dearborn Street, Chicago, including a one-story iron works, 80 x 250 ft., to be equipped with traveling crane; one-story brass foundry, 68 x 100 ft.; one-story woodworking and carpenter shop, 52 x 168 ft.; two-story storehouse and distributing shop, 68 x 300 ft.; oil and paint house, wash and locker buildings, etc. The entire project will cost $6,000,000.

The Kingsport Foundry & Machine Co., Kingsport, Tenn., has concluded negotiations for the purchase of the plant and business of Marion Foundry & Machine Works, Marion, Va. The new owner is said to be considering the early removal of the equipment to its Kingsport works, which will be enlarged. J. B. Burger is general manager.

The Fordson Coal Co., Stone, Ky., an interest of the Ford Motor Co., Highland Park, Detroit, is said to be planning to rebuild the portion of the tipple at its local mining properties destroyed by fire March 6, with loss estimated at $50,000 including equipment.

Browder & Hoskins, Louisville, local representatives for the Chevrolet automobile, have plans under way for a two-story service, repair and garage building, to cost $100,000 with equipment.

The W. S. Dickey Clay Mfg. Co., New York Life Building, Kansas City, Mo., has plans under way for a four-story addition to its branch plant at Chattanooga, Tenn., for clay-drying and conditioning, estimated to cost $50,000.

The Dayton Standard Scale Co., Schwind Building, Dayton, Ohio, recently incorporated, has equipped a local plant for the manufacture of heavy duty truck scales and farm scales.

The Hamilton Autographic Register Co., Hamilton, Ohio, has under construction an addition, 50 x 120 ft., with wing, to provide for its increased business. C. Benninghofen is president.

Cleveland

CLEVELAND, March 15.

SOME machine tool dealers report an increase in business the past week, but generally the market is rather dull. Considerable single tool business which had been pending was closed and accounted for the greater activity. A local manufacturer of turret lathes reports a large number of orders, but all for single machines from diversified industries and widely scattered sources. Little business is coming at present from the automotive industry. No new inquiries have come out for lots of any size.

The Electric Auto-Lite Co., Toledo, Ohio, manufacturer of electrical equipment for automobiles has placed a general contract with A. Bentley & Sons, Toledo, for a four-story factory, 100 x 120 ft. and a one-story machine shop, 100 x 140 ft.

The city of Alliance, Ohio, is awarding contracts for extensions to its waterworks system, which will include additional pumping equipment. A. E. Anderson is city engineer and George B. Gascoigne, 1149 Leader News Building, Cleveland, is the consulting engineer.

The Safety Stair Tread Co., Wooster, Ohio, has taken bids for a one-story factory, 80 x 180 ft. Charles E. Loehr is general manager. The Christian, Schwarzenberg & Gaede Co., 1900 Euclid Avenue, Cleveland, is the architect and engineer.

The Board of County Commissioners, Jefferson, Ashtabula County, Ohio, will receive bids April 5 for a sewage disposal plant to be built at an estimated cost of $140,000. R. F. MacDowell, 1770 East Eleventh Street, Cleveland, is consulting engineer.

The Fairfield Engineering Co., Marion, Ohio, manufacturer of conveying equipment will build a one-story machine shop, 60 x 65 ft.

The Wellman Bronze Co., Cleveland, has dismantled the plant of the City Brass Foundry Co. and moved the equipment to its enlarged plant at 6017 Superior Avenue. With the increased capacity the Wellman Bronze Co. has one of the largest foundries in Cleveland given over entirely to the manufacture of brass, bronze and aluminum castings.

The Eaton Bumper & Spring Service Co., a subsidiary of the Eaton Axle & Spring Co., Cleveland, has been incorporated and will represent the parent company in the sales and service of Eaton bumpers and Eaton springs and will also engage in the manufacture of passenger cars and truck springs, serving the States of Missouri, Kansas, Nebraska, Iowa and northeastern Oklahoma. The necessary equipment and materials for the opening of the new plant, located at 1601 Oak Street, Kansas City, Mo., have been purchased.

Gulf States

BIRMINGHAM, March 15.

A FUND of $4,000,000 is being arranged by the Florida Public Service Co., Lake Wales, Fla., for an expansion program during 1926. The work will include the construction of a steam-operated electric power plant at Benson Springs to cost about $2,000,000; work on initial unit is being started, to have a capacity of 12,500 kw. Other units will be built later. A transmission line will be constructed from the new station to Lake Wales. The company is operated by the General Gas & Electric Co., 50 Pine Street, New York.

The Southern Steel & Rolling Mill, Inc., 3900 North Tenth Avenue, Birmingham, is in the market for an industrial motor, about 200 hp., 3-phase, 60-cycle, 440 or 2200 volts, 600 r.p.m., with reduction gear for 250 to 275 r.p.m.

F. M. Jacob, Columbus, Miss., has plans for a one-story foundry, 25 x 100 ft., for the manufacture of iron castings. A department for wire-working will also be installed. The plant will cost about $50,000 with equipment.

The Alabama Lime & Stone Corporation, 1306 First Avenue, North, Birmingham, operating the O'Neals Lime Works, has plans for a new works for the production of high calcium lime, as well as agricultural lime, mineral dust, etc., to cost in excess of $100,000. The Shaffer Engineering Co., House Building, Pittsburgh, is engineer.

The Upham Gas Co., Mount Vernon, Ohio, is said to have preliminary plans for the construction of a pipe line from the Shamrock, Tex., oil fields to Childress, Tex., about 60 miles. A pipe line to Quanah, Tex., will be built closely following. The company is disposing of a bond issue of $650,000 for expansion. James A. Upham is president.

The McCormack Brothers Motor Co., 301 South Twenty-first Street, Birmingham, has tentative plans for a new service, repair and garage building, 100 x 200 ft., to cost about $110,000 with equipment.

The Town Council, Agurs, La., plans the installation of pumping equipment in connection with a proposed municipal waterworks, estimated to cost $37,500.

The Laurel Hollow Tile Mfg. Co., Laurel, Miss., B. A. Schneider, head, has plans under advisement for new works to manufacture hollow tile and kindred products, to cost $75,000 with equipment.

The Continental Roofing & Mfg. Co., Tacon Station, Mobile, Ala., is planning a one-story addition, 90 x 100 ft., to cost $25,000 with equipment. Douglas G. Blair is general manager.

The Electric Ice Co., Prichard, Ala., recently organized with a capital of $50,000, will build a one-story ice-manufacturing plant on the Craft Highway, with initial output of 60 tons per day. G. E. Thomason is secretary.

The Equitable Equipment Co., Inc., New Orleans, has inquiries out for pumping equipment, including a steam-operated fire pump with capacity of 1000 gal. per min.

The Common Council, Webb, Miss., plans the installation of pumping equipment in connection with a proposed mu-

nicipal water system, for which a bond issue of $35,000 is being arranged. Henry A. Montz, Citizens' Bank Building, Hammond, La., is consulting engineer.

The St. Petersburg Motor Co., St. Petersburg, Fla., will soon proceed with work on a three-story service, repair and garage building, to cost $85,000, with equipment. One floor will be equipped as a machine shop and parts department. T. M. Kelley is general manager.

The Southern Ice & Utilities Co., Santa Fe Building, Dallas, Tex., will soon begin the erection of a one-story cold storage and refrigerating plant at Paris, Tex., to cost $35,000 with machinery.

The Stewart Machine Co., 1106 First Avenue, Birmingham, has acquired property, 240 x 400 ft., at Twenty-eighth Street and Ninth Avenue, North, for the construction of a new one-story plant, to cost about $100,000 with equipment.

School District No. 1, Baton Rouge, La., plans the installation of manual training equipment in the proposed two-story and basement high school for negroes in East Baton Rouge Parish, estimated to cost $160,000. Jones, Roessle & Olschner, Baton Rouge, are architects.

D. W. Thorp, Jr., city manager, Auburndale, Fla., is planning to purchase deep-well pumping machinery and auxiliary equipment in connection with proposed extensions and improvements in the municipal waterworks. A fund of $70,000 has been arranged for the work.

The Western Public Service Co., Beaumont, Tex., will make extensions and improvements in its ice-manufacturing and cold storage plant at Sour Lake, Tex., including the installation of additional equipment. J. G. Holtzclaw is general manager.

The Worthington Mfg. Co., Harvey-Snider Building, Wichita Falls, Tex., has been incorporated to manufacture internal combustion engines, parts and accessories. At present it is confining activities to marketing the Lincoln magnetic timer for Ford cars, trucks and tractors, these being made on contract. No arrangement has been made by the company for the construction of its own factory.

Milwaukee

MILWAUKEE, March 15.

MACHINE tool business is proceeding moderately, with inquiry improving. Sales consist mainly of single tools, but the encouraging feature now is that the number of buyers is constantly increasing and thus building up a better sales volume. Foundry and machine shop business is very satisfactory and complaints of a scarcity of skilled men are more frequent. Tool builders find it extremely difficult to increase forces in proportion to production requirements and delivery specifications.

The J. H. Walder Mfg. Co., Milwaukee, has been organized with $25,000 capital stock by Jacob H. Walder, to take over and develop his wire working business at 393 Third Street. Plans are being made for enlargement and the installation of additional machinery for making forms, fixtures, etc.

The Mohr-Jones Hardware Co., Racine, Wis., operating a large sheet metal works, has acquired additional property for a prospective extension to its plant. A decision relative to the time when construction is to begin will be made shortly.

The Val Blatz Brewing Co., 604 Broadway, Milwaukee, will award contracts March 18 for the construction of a public garage and service building, 60 x 156 ft., part two stories and basement, at a cost of about $50,000. Plans are by William Gauger, 36 West Randolph Street, Chicago, and Henry G. Lotter, Milwaukee, associated architects.

The Common Council, Kilbourn City, Wis., is taking bids on several items of equipment for the municipal waterworks pumping station, including a motor-driven centrifugal pumping unit of 750 gal. per min. capacity. The consulting engineer is Robert Cramer, 448 Twenty-seventh Street, Milwaukee. William R. Smith is city clerk.

The Wastman Mfg. Co., Manitowoc, Wis., manufacturer of hose couplings and similar metal products, has engaged Smith & Brandt, architects, Appleton and Manitwoc, to prepare plans for a $25,000 addition. Bids probably will be taken about April 15.

The Wisconsin State Board of Control, State Capitol, Madison, will close bids April 14 for furnishing the complete equipment of a light, heat and power plant to be erected at the State Tuberculosis Camp near Tomahawk Lake, Wis. The requirements include boilers, engine, generator and exciter, air compressors, pumps, etc. A. W. Bayley is secretary of the board.

The Board of Education, Marshfield, Wis., has accepted bids for the construction of a $300,000 addition to the Purdy vocational and junior high school. The architects are Parkinson & Dockendorff, LaCrosse, Wis.

South Atlantic States

BALTIMORE, March 15.

THE Rustless Iron Corporation of America, Inc., Baltimore, recently organized, represented by Lyman Sessen, 68 William Street, New York, attorney, is said to have plans under consideration for new works on Loneys Lane, to cost about $75,000.

The Consolidated Gas, Electric Light & Power Co., Lexington Building, Baltimore, is arranging for the early construction of its electric generating plant on Gould Street, with initial unit to cost $3,000,000 with machinery. Herbert A. Wagner is president.

D. C. Elphinstone, Inc., 120 South Calvert Street, Baltimore, engineer, has inquiries out for a 10-ton crane, crawler type, gasoline driven, with 40-ft. boom.

The Penn-Seaboard Steel Corporation, Newcastle, Del., has work in progress on additions to its local mill and will soon begin the installation of equipment for tool steel and other production. Headquarters are in the Franklin Bank Building, Philadelphia.

Following the approval by the State Legislature of a bill permitting the operation of an industrial alcohol plant at Norfolk, Va., the Old Dominion Distillers Corporation of that city is completing plans for the early erection of the first unit of its proposed mill, estimated to cost $1,000,000 with machinery.

The Gunton Park Anthracite Colleries Corporation, 208 Delaware Trust Building, Wilmington, Del., L. H. Ball, president, is planning the early installation of additional mining and operating machinery, including electric power equipment, at its properties near Pulaski, Va. A bond issue of $600,000, is being sold, a portion of the fund to be used for the expansion.

The Yellow Cab Co., 1123 Cathedral Street, Baltimore, has acquired a portion of the former plant of the Detrick & Harvey Machine Co., 508 East Preston Street, and will remodel for a new automobile service, repair and garage building, to cost $75,000. W. Woodward Cloud is president.

The Westinghouse Electric & Mfg. Co., East Pittsburgh, is reported to be planning the construction of a new plant at Valdosta, Ga., for the manufacture of spun-metal lighting standards and kindred products, to cost $85,000 with equipment.

The Goodyear Tire & Rubber Co., Akron, Ohio, has acquired the plant and property of the Cedartown Cotton & Export Co., Cedartown, Ga., known as the Paragon Mill, and will operate as a branch works. Plans are under way for the installation of machinery, to double the present output, to cost in excess of $150,000. Lockwood, Greene & Co., Atlanta, Ga., are architects and engineers.

The McNamara Brothers Co., Kloman Avenue, Westport, Baltimore, manufacturer of boilers, tanks and kindred plate products, will soon begin the erection of a one-story addition, 73 x 100 ft., to cost $25,000.

The Wilson-Hock Co., City Point, Va., machinery dealer, has inquiries out for a 200-kw. engine-generator set, 60-cycle, 440-volts, direct-connected; also for a 125-kw. engine-generator set, belted; one 48 x 48 in. heavy-duty Corliss engine, to operate at 200-lb. steam pressure; one mechanical fan, 60-in. diameter, slow speed, and one 48-in. hydro-extractor.

The City Council, Hagerstown, Md., is reported to be planning to use an available fund of about $85,000 for a municipal electric light and power house, following refusal of court of appeals to permit a new bond issue. Charles E. Bowman, mayor, is in charge.

The United States Coast Guard, Washington, is asking bids until April 1 for 10 to 35 centrifugal pump sets, motor-driven; 10 to 35 oil engine generator sets, and 10 to 35 switchboards and equipment.

L. A. Headen, Albany, Ga., and associates are completing plans for a one-story automobile assembling plant, to cost $25,000 with equipment.

Lewter F. Hobbs, Norfolk, Va., machinery dealer, has inquiries out for a Byers type crane, mounted on four wheels, 30-ft. boom.

The Washington Suburban Sanitary Commission, Evans Building, New York Avenue, Washington, is asking bids until March 26 for one 150,000-gal. elevated steel tank. Robert B. Morse is chief engineer of district, Hyattsville, Md.

The Board of Commissioners, Monroe, N. C., is asking bids until April 6 for equipment for waterworks extensions and improvements, including raw-water pumping station,

sewage pumping plant, water-purification equipment, etc. The Carolina Engineering Co., Johnston Building, Charlotte, N. C., is engineer.

Plans are being completed for a merger of the Carolina Power & Light Co., Raleigh, N. C.; Yadkin River Power Co., Raleigh; Asheville Power & Light Co., Asheville, N. C.; Pigeon River Power Co., and the Carolina Power Co., Raleigh and vicinity, taking the name of the first noted organization. Plans are under consideration for expansion to cost close to $20,000,000, including the construction of a hydroelectric generating plant on the Yadkin River, near Norwood, and building a similar power station on the Pigeon River, near the Tennessee State line, with steel tower transmission lines, power sub-stations, etc. The consolidated company will be operated under the direction of the Electric Bond & Share Co., 71 Broadway, New York.

The Piedmont Electrical Co., Electrical Building, Asheville, N. C., is in the market for a 100-kw. engine-generator set, 3-phase, 60-cycle, 2300 volts, direct connected, engine of automatic type, complete with exciter and switchboard.

The Morgan Millwork Co., 113 West North Avenue, Baltimore, is completing plans for a new plant at Greensboro, N. C., two stories, 100 x 200 ft., to cost $100,000 with machinery. James M. Workman, American Bank Building, Greensboro, is architect.

The Standard Oil Co., Baltimore, contemplates construction of a one-story repair shop and storage building at Eighth and O'Donnell Streets to cost about $25,000.

The Town Council, New Market, Va., is asking bids until March 30 for equipment for a water supply and sewage system, including pumping machinery and auxiliary equipment, and 10,000 lb. cast iron specials. The American Industries Engineering Co., 140 Cedar Street, New York, is engineer; the Carolina Engineering Co., Johnston Building, Charlotte, N. C., is associate engineer.

The Kulair Corporation, Norfolk, Va., has been incorporated with an authorized capital of $2,000,000 to manufacture household refrigerating machines, using ethyl chlorid as a refrigerant. These machines will be produced under contract for the Black Rock Mfg. Co., Bridgeport, Conn. Officers of the Kulair Corporation are: Phillips F. Lee, president, Baltimore; W. W. Moss, vice-president, Norfolk, Va.; Frank C. Brady, secretary-treasurer, Baltimore.

Buffalo

BUFFALO, March 15.

PLANS have been filed by the Standard Foundry Co., 743 Hertel Avenue, Buffalo, for a one-story addition to cost approximately $16,000.

The Larrabee-Deyo Motor Truck Co., Binghamton, N. Y., is said to have preliminary plans for new works at Main and Emma Streets to cost $75,000. I. T. Deyo is one of the heads of the company.

The Great Lakes Portland Cement Co., Marine Trust Building, Buffalo, A. L. Beck, president, has plans under way for a proposed mill on the Hamburgh Turnpike, estimated to cost $2,000,000. The project will include a power house and machine shop.

The Stromberg-Carlson Telephone Mfg. Co., 1060 University Avenue, Rochester, N. Y., manufacturer of intercommunicating telephone systems and equipment, is asking bids for a one-story addition, 160 x 470 ft., to cost $100,000 with equipment. S. Firestone, 59 South Avenue, is engineer. W. R. McCanne is president and general manager.

The Board of Trustees, Cornell University, Ithaca, N. Y., is considering the installation of pumping equipment in connection with a proposed new water supply system, for which an appropriation of $175,000 has been made.

The Louisville Cement Co., Louisville, has awarded a general contract to the John W. Cowper Co., Inc., Fidelity Building, Buffalo, for a new one-story mill at Akron, N. Y., to cost $225,000 with machinery. R. J. Hartsock, Akron, is company representative.

The F. N. Burt Co., Ltd., 546 Seneca Street, Buffalo, manufacturer of paper boxes and containers, has plans for an addition to cost about $50,000. It is expected to ask bids in about 30 days. Plumer & Mann, 700 Main Street, are architects. M. R. Cass is general manager.

The Ogden R. Adams Co., Inc., Rochester, is inquiring for the following used machines: One 4, 5, or 6-spindle No. 2 Avey, or similar, drill, belt or motor driven, one spindle to have tapping attachment; No. 2 Williams & White bending and straightening machine; one 4-in. and one 8-in. Landis pipe machine; one No. 202-B geared Toledo, or similar, press, double crank, 16-in. stroke; one No. 6 V. & O., or similar, press.

The Board of Education, Corning, N. Y., is considering the installation of manual training equipment in its proposed two-story junior high school to cost $350,000, for which bids will be asked on a general contract in April. Palmer & Rogers, 101 Park Avenue, New York, are architects.

St. Louis

ST. LOUIS, March 15.

THE Vesper Buick Automobile Co., Grand and Lindell Streets, St. Louis, local representative for the Buick automobile, has plans for the erection of a two-story and basement service, repair and garage building, 100 x 215 ft., to cost $150,000 with equipment. F. W. A. Vesper is president.

The South Arkansas Ice Co., Smackover, Ark., is arranging for a one-story ice-manufacturing plant at Louann, Ark., for an initial daily output of 60 tons. L. L. Sligh is superintendent.

The Board of Education, Ellinwood, Kan., is considering the installation of manual training equipment in its proposed two-story high school to cost $150,000, for which bids have been asked on general contract. Schmidt, Boucher & Overend, Fourth National Bank Building, Wichita, Kan., are architects.

The Pure Oil Co., Pure Oil Building, Columbus, Ohio, has acquired additional property adjoining its refinery at Muskogee, Okla., and has plans for enlargements. A number of stills, cracking machinery, storage tanks and other equipment will be installed. The entire project is reported to cost $1,000,000 with equipment.

The American Salt Co., Waldheim Building, Kansas City, Kan., G. P. Kelly, president, will soon begin work on the proposed addition to its evaporation plant at Lyons, Kan., to cost about $400,000 with equipment. A general contract for building has been let to H. W. Underhill & Co., 235 North Waco Street, Wichita, Kan.

The Terminal Warehouse Corporation, 1910 Summit Avenue, Little Rock, Ark., plans the installation of a cold storage and refrigerating plant in a proposed five-story terminal warehouse on Markham Street, to cost approximately $750,000 with equipment. Mann & Stern, A. O. U. W. Building, are architects. S. J. Beauchamp is head.

The Lincoln Public Service Co., Lincoln, Neb., representing a consolidation of the Lincoln Gas & Electric Co. and the Lincoln Traction Co., has tentative plans for a new mechanical service and repair building, including meter shops, machine repair shop, etc., to cost $150,000 with equipment.

Ovens, power equipment, conveying and other machinery will be installed in the two-story plant, 119 x 130 ft., to be erected by the A. J. Cripe Baking Co., St. Joseph, Mo., to cost $130,000. Webb Siemens, Bartlett Building, is architect.

The Norphlet Ice Co., Norphlet, Ark., will soon begin the construction of a one-story ice-manufacturing plant to cost about $30,000 with machinery. R. E. Healy is general manager.

The Dewey Portland Cement Co., 301 Mutual Building, Kansas City, Mo., plans the construction of a new power house at its proposed mill at Davenport, Iowa. The entire project will cost $2,500,000. The J. C. Buckbee Co., 38 South Dearborn Street, Chicago, is engineer.

Detroit

DETROIT, March 15.

WORK will soon begin on an addition to the plant of the Piston Ring Co., Muskegon, Mich., to cost about $100,000, including machinery.

The Ford Motor Co., Detroit, is having plans drawn for a one-story addition to the steel spring department. Albert Kahn, Inc., Marquette Building, is architect and engineer.

The Detroit & Michigan Stove Co., 6900 East Jefferson Street, Detroit, has awarded a general contract to the Marlow-Barry Co., 2631 Woodward Avenue, for its proposed five-story addition, 84 x 175 ft., to cost about $125,000. W. T. Barbour is president.

The New Egyptian Portland Cement Co., Fenton, Mich., is disposing of a preferred stock issue of $600,000, a considerable portion of the proceeds to be used for expansion and betterments. Maynard D. Smith is president.

The Lenawee Sand & Gravel Co., Tecumseh, Mich., is considering the installation of additional machinery at its mining properties, including hoisting, conveying, loading and other equipment, to cost $50,000.

J. T. Murphy, Battle Creek, Mich., is organizing a company to establish a local plant for the manufacture of a rapid action fire hydrant, recently invented. The company will be capitalized at $100,000. The plant will cost approximately $50,000 with equipment.

The Board of Education, Detroit, has plans under consideration for a new trade and vocational school to cost $240,000 with equipment.

The Board of Education, Battle Creek, Mich., plans the installation of manual training equipment in its proposed two-story and basement junior high school to cost $500,000, for which bids will be asked in April. J. D. Chubb, 109 North Dearborn Street, Chicago, is architect.

The Chrysler Corporation, Detroit, manufacturer of automobiles, has work under way on a one-story addition 286 x 820 ft. Erection contract is being handled by the H. K. Ferguson Co., Cleveland. Walter Chrysler is president.

The Roseberry-Henry Electric Co., Grand Rapids, Mich., has filed plans for a four-story addition to provide a total floor area of about 35,000 sq. ft. It will cost approximately $70,000.

The Grand Haven Brass Foundry, 618 Lafayette Street, Grand Haven, Mich., is considering plans for a two-story addition, to cost $35,000 with equipment. A. E. Jacobson is general manager.

The Consolidated Boilers Corporation, Benton Harbor, Mich., recently organized with a capital of $150,000, is completing arrangements for the early construction of a plant to manufacture steam and hot water boilers, and kindred plate products. An existing business will be removed from Chicago and additional equipment installed. The new plant is reported to cost $100,000. The company is headed by Harry V. Tutton and Adolph T. Johanson, both of Benton Harbor.

The Angle Steel Stool Co., Otsego, Mich., has tentative plans for a new one-story unit, to cost $40,000 with equipment.

Indiana

INDIANAPOLIS, March 15.

CONTRACT has been let by the Gates Mfg. Co., 835 North Meridian Avenue, Indianapolis, manufacturer of automobile tops and equipment, to T. B. Laycock, 1011 Fayette Street, for a two-story addition, 80 x 100 ft., to cost about $35,000 with equipment.

The Davis Mfg. Co., Chicago, manufacturer of talking machine and radio cabinets, etc., has acquired the former assembling plant of the Haynes Automobile Co., Kokomo, Ind., now in receivership, for a cash price of $150,000, and will remodel for a branch plant.

J. E. Deutsch, 522 Broadway, Gary, Ind., architect, has completed plans for a three-story automobile service, repair and garage building, 90 x 100 ft., to cost $75,000 with equipment.

The Indiana & Michigan Electric Co., South Bend, Ind., is disposing of a bond issue of $3,283,000, a portion of the fund to be used for extensions and improvements in power plant and system, including the installation of additional equipment.

George L. Mesker & Co., 100 North First Street, Evansville, Ind., manufacturer of cast iron frames and other iron castings, will soon begin construction of a one-story foundry addition, 50 x 150 ft., to cost $30,000 with equipment.

The Board of Education, Williamsport, Ind., plans the installation of manual training equipment in its proposed two-story and basement high and grade school to cost $115,000, for which bids will be asked at once on general contract. Leonard Steube, Adams Boulevard, Danville, Ill., is architect.

The New York, Chicago & St. Louis Railroad, Cleveland, known as the Nickel Plate system, has authorized plans for rebuilding its shops at Frankfort, Ind., destroyed by fire March 9, with loss estimated at $300,000, including machinery.

The Berryhill Malleable Iron Co., Evansville, Ind., operating a local foundry and iron works, recently established, has arranged for an increase in capital from $150,000 and 7500 shares of stock, no par value, to $200,000 and 10,000 shares of stock, no par value, the proceeds to be used in part for expansion.

The factory of the Lindeman Wood Finish Co., 1602 West Washington Street, Indianapolis, suffered loss of $30,000 from fire on March 10. It will be rebuilt immediately. Harry Gompf is general manager.

The Terre Haute, Indianapolis & Eastern Traction Co., Indianapolis, has plans for doubling the output of its power house on West Tenth Street. Approximately $3,500,000 will be expended on new equipment, including a large turbo generator and four power boilers.

The Citizens' Gas Co., Indianapolis, has plans for a sulphate of ammonia plant to cost $350,000 and is contemplating the expenditure of $450,000 for a domestic coke screening plant and coal handling equipment.

Pacific Coast

SAN FRANCISCO, March 10.

PLANS are being prepared by the Illinois-Pacific Glass Co., Fifteenth and Folsom Streets, San Francisco, manufacturer of bottles and other hollow ware, for a six-story addition, 195 x 256 ft., to cost $600,000 with equipment. A. Toriggino, Mills Building, is architect. P. D. Burtt will be manager of construction for the company.

Fire, March 6, damaged a portion of the plants of the O. B. Williams Sash & Door Co., and the American Portable House Co., Seattle, occupying adjoining sites, with combined loss reported at $50,000, including equipment. Both companies are planning to rebuild.

C. W. Wilmeroth, Wenatchee, Wash., and associates are having plans prepared for a two-story and basement cold storage and refrigerating plant at Columbia and Chehalis Streets, 110 x 185 ft., to cost $100,000 with equipment.

The City Council, Tacoma, Wash., will soon ask bids for a new pumping station and equipment for the municipal waterworks, to develop an output of 1,000,000 gal. per day. W. A. Kunig is superintendent of the water department, in charge.

The State Board of Harbor Commissioners, San Francisco, has authorized plans for a one-story machine shop on the waterfront, for repair and maintenance of harbor equipment, reported to cost $65,000. Frank G. White, Ferry Building, is engineer for the commissioners.

The Pacific Tank & Pipe Co., 4820 Santa Fe Avenue, Vernon, Los Angeles, will soon have plans drawn for rebuilding the portion of its works destroyed by fire March 2, with loss reported at $90,000 including equipment. The company will also build a new one-story storage and equipment building, 60 x 150 ft., by day labor.

The Southern California Iron & Steel Co., Randolph Street, Los Angeles, has awarded a general contract to the Union Iron Works, 5125 Santa Fe Avenue, for its proposed one-story addition, 64 x 190 ft., to cost approximately $45,000.

Guy W. Talbot, head of the Pacific Power & Light Co., Portland, and associates have had plans prepared for a five-story and basement automobile service, repair and garage building, 100 x 200 ft., estimated to cost $360,000 with equipment. It is expected to complete the structure during the summer.

The Salinas Ice Co., Salinas, Cal., is planning enlargements in its ice-manufacturing plant to increase the capacity about 50 tons per day. It is also purposed to make additions to the cold storage department. Frank S. Meyers is manager.

The Coast Metal Products Co., Oakland, Cal., has awarded a general contract to the James Construction Co., 2300 Eighty-seventh Avenue, for a new one-story plant, to cost about $25,000 with equipment.

The Union Iron Works, Los Angeles, has purchased a 30-acre tract in the Bandini Industrial district.

Canada

TORONTO, March 15.

SALES of machine tools in this market continue in good volume with both dealers and manufacturers. Inquiries are also appearing at frequent intervals and some large orders are expected to develop within the next six weeks. A stronger demand for machinery has recently come from steel plants, foundries, car builders and the automotive industry. Considerable improvement is shown in the call for small tools.

The St. Regis Paper Co., Cap Rouge, Que., will start work shortly on the construction of a new mill. Power will be supplied by the Quebec Power Co.

The Donnacona Paper Co., Ltd., Donnacona, Que., is having plans prepared by the engineer, J. A. Beauchemin, for a power development project to cost $500,000.

J. G. Shepard & Co. have been organized to acquire the plant of the West Lake Brick & Products Co., Ltd., and will remove the machinery from West Lake to Wellington, Ont., where a new plant is under construction.

The Canadian International Paper Co., Montreal, proposes to start work soon on a power development plant on the Gatineau River at Farmers, Que., to cost $8,000,000.

The Toronto Hardware Mfg. Co., Ltd., 390 Dufferin Street, Toronto, is in the market for a quantity of scrap zinc.

The International Nickel Co., is having plans prepared for an addition to its Port Colborne, Ont., works to cost $750,000. The proposed unit is one of six of similar size that are contemplated to turn the entire output into electrolytic nickel should the demand arise. The company is asking a fixed assessment of $750,000 for ten years.

James Steele, Ltd., Guelph, Ont., is inquiring for one used Bliss consolidated geared double-crank press, No. 104 or 105.

Western Canada

Hodgson, King & Marble, London Building, Vancouver, B. C., have the general contract for the erection of a machine shop at Esquimalt, B. C., for Yarrows, Ltd., to cost $12,000.

The Scottish Canadian Paper Co., Twelfth Street, New Westminster, B. C., has started construction on the first unit of a paper mill to cost $40,000.

The Manitoba Paper Co., Winnipeg, Man., has applied for permission to take over the plant and business of the Manitoba Pulp & Paper Co. The new company will have a capital stock of $11,500,000, compared with $2,300,000 of the former concern. It is also the intention to develop the pulp wood resources of Manitoba. Travers Sweatman, K. C., of Ottawa, Ont., is counsel for the company.

Foreign

THE Amtorg Trading Corporation, 165 Broadway, New York, will be in charge of equipment purchases for two projects for the Russian Soviet Government, now maturing. The first covers the electrification of the suburban railroads at Moscow, now operated by steam power, with cost ranging from $2,000,000 to $10,000,000, according to extent of lines. The other project provides for a hydroelectric generating plant on the Dnieper River, with ultimate capacity of 600,000 hp., to cost from $50,000,000 upward. The output will be used for the proposed electrification of the Ukranian metallurgical industry. Alexis V. Prigarin has recently been elected chairman of the board of the Amtorg organization.

The American Chamber of Commerce in France, 32 Rue Taitbout, Paris, has received an inquiry (B-3232) from a local interest for American rock crushing machinery.

The Bureau of Foreign and Domestic Commerce, Washington, has information regarding a proposed automobile tire plant to be constructed at Stoke-on-Trent, England, by a French company, estimated to cost approximately $2,500,000 with machinery. It is purposed to have the first unit completed in about twelve months. (Reference No. 199153).

Franz Steinbach, 8 Luneburger Strasse, Berlin, N. W., 52, Germany, importer, is announced in the last issue of *German Trade Reports and Opportunities* as being in the market for a quantity of American machine tools for metal-working industries.

The municipal officials at Nagoya, Japan, plan the installation of a complete cold storage and refrigerating plant in a proposed central market to be constructed during the year at an estimated cost of about $2,000,000. The American Consulate, H. T. Goodier, consul, Nagoya, has information regarding the project.

Sales of General Motors Corporation Highest Ever Obtained

Net sales and net profits of the General Motors Corporation in 1925 were the greatest in the history of the corporation. Sales aggregated $734,592,592, which displaced the previous high record of $698,038,947 in 1923. The 1924 figure was $568,007,459. After charges, taxes and preferred and debenture dividend requirements there was available $98,844,765 for dividends on common stock, equivalent to $19.15 per share. This compares with $38,058,251 in 1924, or $7.37 per share. Operating profit in 1925 was reported at $149,296,499, or more than double the $71,802,424 of 1924. Profit and loss surplus at the end of the year amounted to $119,020,472. Current assets at that time aggregated $290,869,088 and current liabilities, $109,042,207.

Another record was made in the sale of cars and trucks for both domestic and export account. The total was 827,056 cars, exceeding the highest previous record by 95,775 cars, or 13.1 per cent. Sales for export aggregated 100,894 units, or more than 50 per cent above the 64,845 in 1924, which was the previous record. Wholesale value of cars sold for export aggregated $77,109,696, against $50,929,322 in 1924 and $19,875,015 in 1922.

Harbison-Walker Earnings Good Last Year

Last year was a good one for the Harbison-Walker Refractories Co., Pittsburgh, which, after allowing $40,347 more for ordinary expenses and Federal taxes than in 1924, had net earnings of $374,221 more than in the previous year. Depreciation and depletion charges were greater in 1925 than the year before by $28,841, but net profits for last year were $351,380 more than those for 1924. The statement follows:

	1925	*1924*
Net earnings	$4,551,620	$4,171,399
Depreciation and depletion	704,127	675,286
Net operating profits	3,847,493	3,496,113
Dividends	2,608,566	1,684,425
Surplus	1,238,927	*3,811,688
Total surplus	†3,765,741	11,526,814

*Included $2,000,000 transferred from a contingency reserve. †After deducting $9,000,000, covering 33⅓ per cent stock dividend on common stock.

H. W. Croft, chairman, in reviewing the year, said: "Business was fairly satisfactory, continuing in about the same volume as the previous year. There were few changes in prices, the average being somwhat better than in 1924. There were no wage changes. The new plant at Bessemer, Ala., was completed in August and has been operating successfully since that time. Our present capacity is now in excellent condition and expenditures for maintenance during the present year should be at a minimum. Our plants have been operating since the first of the year at 80 per cent of rated capacity, assuring a reasonably satisfactory first quarter, with indications that this condition should extend well into the second quarter."

Graton & Knight Reorganization

The stockholders of the Graton & Knight Mfg. Co., Worcester, Mass., manufacturer of leather belting, have voted to adopt a reorganization plan which involves the taking over of all assets and liabilities by a new corporation to be known as the Graton & Knight Corporation. Frank H. Willard, for years vice-president and general manager, will be the president, succeeding John E. White. Charles A. Bartlett will remain as treasurer and Stanley G. Barker as clerk. The board of directors will consist of Mr. Willard, Paul B. Morgan, president and treasurer Morgan Construction Co.; Harry G. Stoddard, vice-president and general manager Wyman-Gordon Co.; Dr. Homer Gage, president Crompton & Knowles Loom Works; J. Verner Critchely, president Walden-Worcester, Inc., all of Worcester; W. Virgil Spaulding, Pasadena, Cal., and Stanley A. Russell, vice-president National City Bank of New York, and George S. Armstrong of the National City Co., New York. The new corporation will have a capitalization of $6,830,400 in 7 per cent cumulative preferred stock and 76,127 shares of no-par common stock. Holders of the present company's preferred shares will receive four-tenths of a share of new preferred and one share of new common stock for each old share, while each share of old common stock will be exchanged for one-twentieth of a share of new common stock. Stockholders are given the opportunity to subscribe to $360,000 new common stock at $12.50 a share. Money so derived will be used to pay off bank loans.

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Current Metal Prices

On Small Lots, Delivered from Stocks, New York

THESE prices are given for the convenience of small-lot buyers whose requirements do not run into mill-size orders.

Only base prices can be listed in some cases, due to limits of space; other items of a given group are deducible from the base price.

The prices which are quoted below are those at which small lots may be bought, whether from jobbers' or other stocks.

Complete market reports and prices on large shipments from mills will be found elsewhere under "Iron and Steel Markets" and "Non-Ferrous Metals."

Bars, Shapes and Plates

	Per Lb.
Bars:	
Refined iron bars, base price	3.24c.
Swedish charcoal iron bars, base	7.00c. to 7.25c.
Soft steel bars, base price	3.14c. to 3.24c.
Hoops, base price	4.49c.
Bands, base price	3.99c.
Beams and channels, angles and tees, 3 in. x ¼ in. and larger base	3.24c. to 3.34c.
Channels, angles and tees under 3 in. x ¼ in. base	3.14c. to 3.24c.
Steel plates, ¼ in. and heavier	3.24c. to 3.34c.

Merchant Steel

	Per Lb.
Tire, 1½ x ½ in. and larger	3.30c.
(Smooth finish, 1 to 2½ x ¼ in. and larger)	3.65c.
Toe-calk, ½ x ⅜ in. and larger	4.20c.
Cold-rolled strip, soft and quarter hard	6.25c.
Open-hearth spring steel	4.50c. to 7.00c.
Shafting and Screw Stock:	
Rounds and hex	4.00c. to 5.00c.
Square and flats	4.50c. to 5.50c.
Standard tool steel, base price	12.00c.
Extra tool steel	15.00c. to 18.00c.
Special tool steel	20.00c. to 23.00c.
High-speed steel, 18 per cent tungsten	70c.

Sheets

Blue Annealed

	Per Lb.
No. 10	3.89c.
No. 12	3.94c.
No. 14	3.99c.
No. 16	4.09c.

Box Annealed—Black

	Soft Steel C. R. One Pass Per Lb.	Long Terne Sheets Per Lb.
Nos. 18 to 20	4.30c.	5.75c.
Nos. 22 and 24	4.35c.	5.90c.
No. 26	4.40c.	6.05c.
No. 28*	4.50c.	6.35c.
No. 30	4.70c.	6.85c.

Galvanized

	Per Lb.
No. 14	4.60c. to 4.75c.
No. 16	4.75c. to 4.90c.
Nos. 18 and 20	4.90c. to 5.05c.
Nos. 22 and 24	5.05c. to 5.20c.
No. 26	5.20c. to 5.35c.
No. 28*	5.50c. to 5.65c.
No. 30	6.00c. to 6.15c.

*No. 28 and lighter, 36 in. wide, 20c. higher per 100 lb.

Welded Pipe

	Standard Steel Black	Galv.	*Wrought Iron* Black	Galv.
½ in. Butt	46	29	½ in. Butt	4	+19
¾ in. Butt	51	37	¾ in. Butt	11	+ 9
1-3 in. Butt	53	39	1-1½ in. Butt	14	+ 6
2½-6 in. Lap	48	35	2-in. Lap	5	+14
7 & 8 in. Lap	44	17	3-6 in. Lap	11	+ 6
11 & 12 in. Lap	37	12	7-12 in. Lap	3	+16

Bolts and Screws

Machine bolts, cut thread, 40 and 10 per cent off list
Carriage bolts, cut thread, 30 and 10 per cent off list
Coach screws, 40 and 10 per cent off list
Wood screws, flat head iron,
77½, 20, 10, 10 and 10 per cent off list

Steel Wire

Base Price† on No. 9 Gage and Coarser	Per Lb.
Bright, basic	4.25c.
Annealed, soft	4.50c.
Galvanized, annealed	5.15c.
Coppered, basic	5.15c.
Tinned, soft Bessemer	6.15c.

†Regular extras for lighter gage.

Brass Sheet, Rod, Tube and Wire

BASE PRICE

High brass sheet	19⅛c. to 20⅛c.
High brass wire	19⅝c. to 20⅝c.
Brass rods	16⅞c. to 17⅞c.
Brass tube, brazed	27⅛c. to 28⅛c.
Brass tube, seamless	23¾c. to 24¾c.
Copper tube, seamless	24½c. to 25½c.

Copper Sheets

Sheet copper, hot rolled, 22¾c. to 23¾c. per lb. base.

Cold rolled, 14 oz. and heavier, 3c. per lb. advance over hot rolled.

Tin Plates

Bright Tin Grade "AAA" Charcoal 14x20	Bright Tin Grade "A" Charcoal 14x20	Coke—14x20	Prime	Seconds
		80 lb.	$6.15	$5.90
		90 lb.	6.30	6.05
		100 lb.	6.45	6.20
IC	$11.25	IC	6.65	6.40
IX	12.85	IX	7.85	7.60
IXX	14.40	IXX	9.00	8.75
IXXX	15.75	IXXX	10.35	10.10
IXXXX	17.00	IXXXX	11.35	11.10

Terne Plates

14 x 20

IC—3-lb. coating	$7.75 to $8.00
IC—20-lb. coating	10.00 to 11.00
IC—30-lb. coating	12.00 to 13.00
IC—40-lb. coating	13.75 to 14.25
Fire-door stock	10.50

Tin

Straits, pig	66 c. to 66¾c.
Bar	69¼c. to 69¾c.

Copper

Lake ingot	15½c.
Electrolytic	15¼c.
Casting	15 c.

Spelter and Sheet Zinc

Western spelter	8½c. to 9c.
Sheet zinc, No. 9, base, casks	13¼c.; open, 13¾c.

Lead and Solder*

American pig lead	9 c. to 10 c.
Bar lead	11¼c. to 12¼c.
Solder, ½ and ½ guaranteed	41c.
No. 1 solder	40c.
Refined solder	33¾c.

*Prices of solder indicated by private brand vary according to composition.

Babbitt Metal

Best grade, per lb	68c. to 72c.
Commercial grade, per lb	30c. to 35c.

Antimony

Asiatic	21½c. to 22½c.

Aluminum

No. 1 aluminum (guaranteed over 99 per cent pure), ingots for remelting, per lb	30c. to 30½c.

Old Metals

Business is quiet with prices unsettled. Dealers' buying prices are as follows:

	Cents Per Lb.
Copper, heavy crucible	12.00
Copper, heavy wire	11.75
Copper, light bottoms	9.50
Brass, heavy	7.00
Brass, light	6.25
Heavy machine composition	8.75
No. 1 yellow brass turnings	8.50
No. 1 red brass or composition turnings	8.00
Lead, heavy	6.75
Lead, tea	5.25
Zinc	4.25
Cast aluminum	18.00
Sheet aluminum	18.00